The Bay Area's Computer Magazine July 9, 1990 • 71 FREE

MICROTIMES™

A SPECIAL ISSUE FOR BUSINESSES AND SOFTWARE ENTREPRENEURS

Ideas To Make Your Business Work Better

Book Excerpt

MANAGING DATA IN YOUR BUSINESS

SQL Systems: What You Need To Know

"SQL is one of the most important technologies driving and shaping the computer market today. From its first commercial implementation a little more than a decade ago, SQL has grown to become the standard database language." ***See page 33***

TROUBLESHOOTING LANS

"You will encounter glitches with unfortunate frequency when you configure PC-based LANs. Even machines like the PS/2 and Macintosh, which have intelligent buses, can be perplexing if software, cables and terminators are incorrectly installed." ***See page 45***

Advice For The Software Entrepreneur

CUSTOMER SUPPORT: PLAN NOW OR PAY LATER

"The easiest mistake to commit at the beginning of the whole process is to focus on the technology rather than on the needs of the people who will ultimately buy the product." ***See page 52***

SHAREWARE MARKETING

"There are quite a few authors supporting themselves quite well with shareware, and they all stress the importance of patience and persistence." ***See page 53***

Show Preview

DATABASE WORLD CONFERENCE AND EXPOSITION

July 17-19, Santa Clara Trade And Convention Center

"If you need to understand the latest developments in database technology—issues like SQL/object integration, client/server computing, distributed database—you'll find Database World a valuable resource." ***See page 48***

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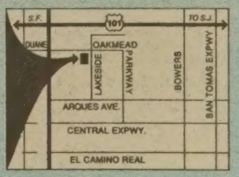

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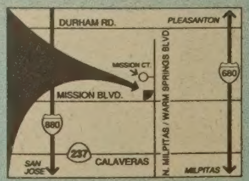

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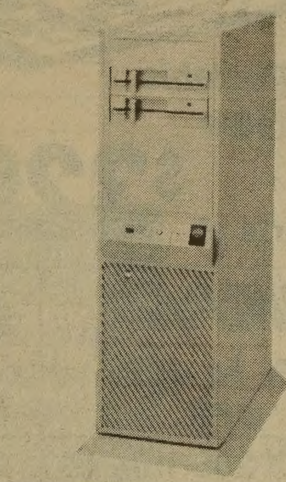

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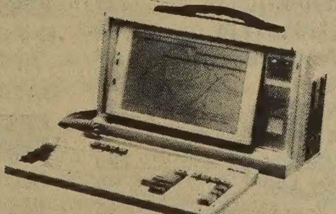

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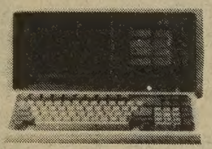

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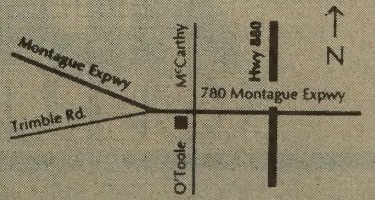

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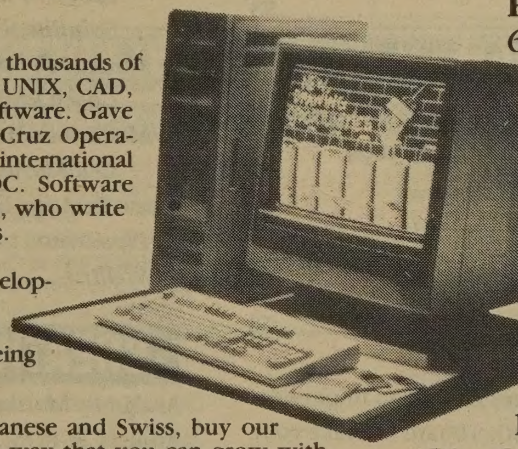

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A NOTE FROM THE EDITORS:

This month we offer a miscellany of resources and advice for those doing business in the increasingly complex world of the microcomputer.

For the business trying to assess and deal with its data needs while planning for future technology, authors James Groff and Paul Weinberg offer an explanation of the emerging SQL standard for relational databases, along with a concise guide to the dominant vendors in the database marketplace. See page 33. The Database World Conference & Expo, previewed on page 48, also offers valuable information management resources.

As networks become a mainstay of the modern office, so do incompatibilities, glitches, and previously-unimagined equipment problems. LAN columnist Wayne Yacco begins a discussion on troubleshooting your LAN while preserving your sanity. See page 45.

For the software entrepreneur who's finding out that overnight success is something of a myth, we offer some advice from the field. Consultant Mikael Blaisdell discusses the crucial importance of customer support to a company's prosperity; shareware author and current ASP Ombudsman Dan Baumbach talks about his own experiences of shareware distribution and explains some of the unexpected benefits and pitfalls. Both stories start on page 52.

BUSINESS SOLUTIONS

Book Excerpt: Managing Data In Your Business 33
SQL Systems: What You Need To Know
By James R. Groff and Paul Weinberg
Excerpted from the recent Osborne/McGraw-Hill book *Using SQL*, this discussion explains the emerging SQL standard and its importance to businesses analyzing their present and future data processing needs. The authors also profile the leading vendors in the relational database marketplace and explain the strengths and weaknesses of each.

Local Area Networks *By Wayne A. Yacco* 45
Efficient testing and troubleshooting.

Database World Conference And Expo Preview 48
Coming to Santa Clara in mid-July, this event offers in-depth conferences and exhibits from leading vendors in the micro, mini, and mainframe computer worlds.

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Customer Support: Design Now Or Pay Later 52
By Mikael Blaisdell
Often overlooked by the technically-minded entrepreneur, customer support is an integral part of a business and often makes the difference between success and failure. Consultant Blaisdell offers specific advice on how to make your product's users one of your company's greatest assets.

STARTUP SURVIVAL KIT

Tales From The Shareware Front Lines *By Dan Baumbach* 53
If you've got a good product and are looking for an effective, low-cost marketing strategy, shareware might be for you. But it's not a panacea. Shareware author Baumbach explains some of the rewards and pitfalls of shareware distribution.

The Zenith MinisPort *By Ed Kahn* 64
Zenith's tiny machine offers some nice features and few tradeoffs.

Install A New Motherboard And Save A Bundle 70
By Aubrey Pilgrim
Do-it-yourself author Aubrey Pilgrim suggests that you might not need a new computer at all, just a new motherboard to make your old one state-of-the-art.

UNIX *By Bennett Falk* 88
Mom explains good system behavior to you.

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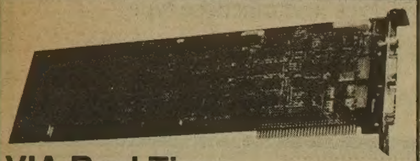

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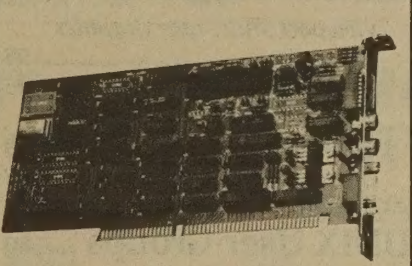

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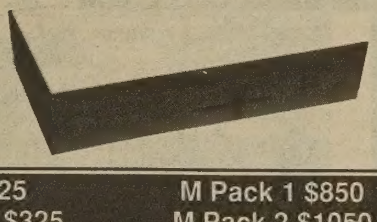

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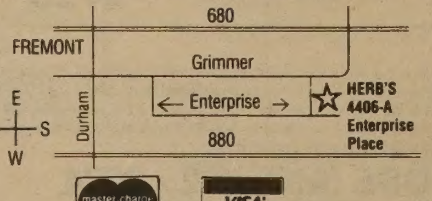

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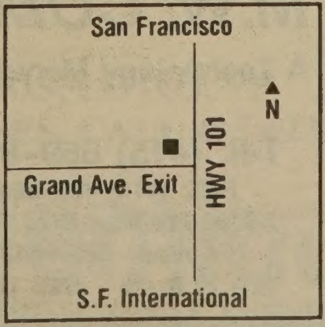

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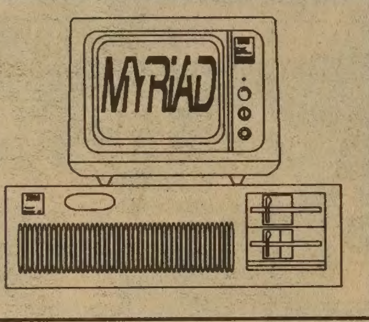

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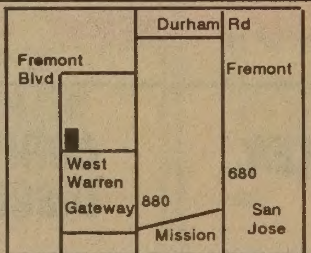

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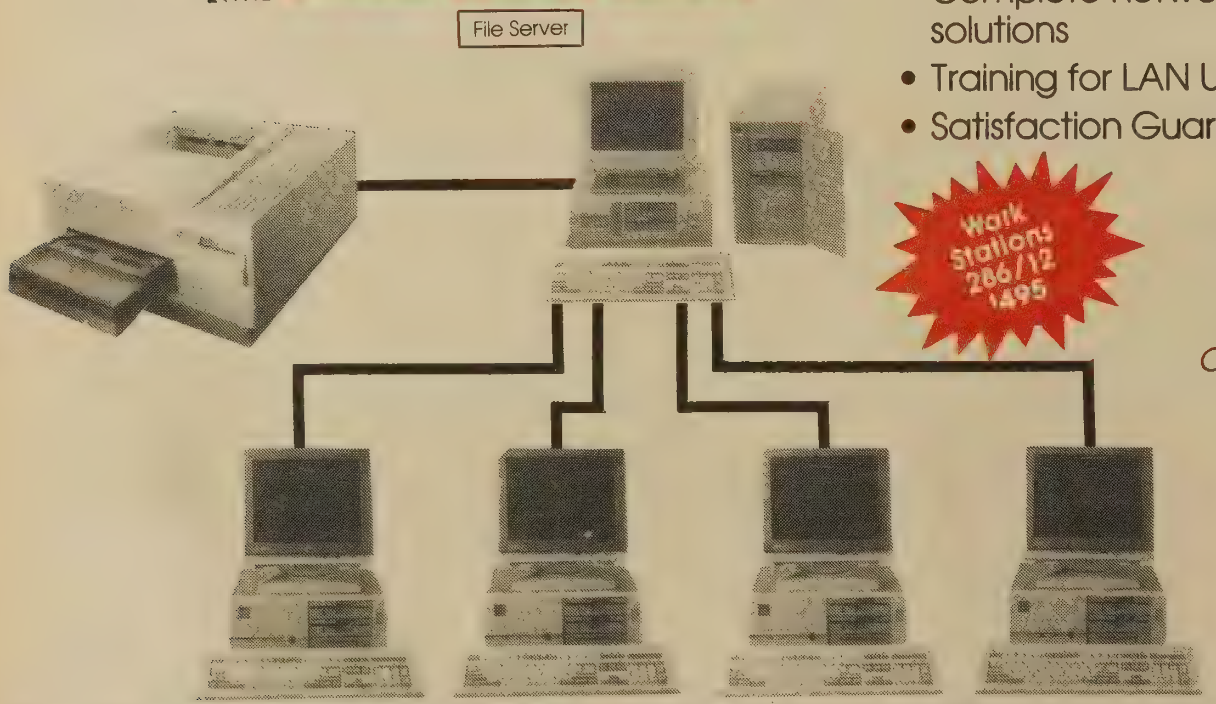

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INDUSTRY INSIGHT

BY PAUL HOFFMAN

WINDOWS 3.0: IT'S REAL, IT SORT OF WORKS, AND IT WILL BE IMPORTANT

Microsoft made it the industry's worst-kept secret. People have been talking about it for almost a year. Software manufacturers have been showing demonstrations on beta-test copies of it for six months. And, with the fanfare usually reserved for new products, Microsoft finally officially announced and simultaneously released Windows 3.0, the graphical operating environment for MS-DOS.

The computer press has had a field day (actually, field month) singing the praises of the software. In fact, it is not that much different from previous versions of Windows, which have not sold very well. This time, however, Microsoft has convinced the software publishers to write for Windows, and will thus be able to convince users to buy it.

Yes, buy it. It is not free. If you already own an 80286- or 80386-based system, you cannot get it for free. The list price is $149, although if you already have a copy of Windows 2 (even the Windows run time that comes with most Windows applications like Excel and Word For Windows), the upgrade price is $50. Microsoft is emphasizing that Windows is not part of the operating system, but is an add-on. You buy it like you buy software.

Many hardware manufacturers are planning to bundle Windows with new systems starting this month, so new buyers will not have to buy it separately. Most of us, however, will need to buy it, or at least pony up the $50 for the upgrade.

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on USENET (phoffman @well) and MCI Mail (264-3171). He also writes popular microcomputer books.

Still A Few Bugs: There are, however, some significant bugs that Microsoft admits to but says it will not fix. Windows 3 has basically two major new features: a better user interface for starting programs, and better memory management. The new user interface, called the Program Manager, shows windows of iconic representations of user applications. The names on the programs can have more than the standard eight uppercase characters. The improved memory management lets you use your PC's memory as "extended memory" which is generally much faster than the "expanded memory" that Windows 2 programs required.

Essentially, Microsoft has given Windows more of the cosmetic features that Macintosh users have assumed to be standard parts of a computer. They didn't go all the way, however, and the press pundits who claim that using Windows 3 is just like using a Macintosh either haven't used a Macintosh much or didn't use much of Windows. For example, the new iconic interface is only available for the Program Manager; it does not apply to the File Manager, the utility you use to move and delete files. Although the new File Manager is much improved over the old one (you can see the tree structure of your directories), it still represents documents by their eight-letter names. Mac users can see all files as icons and can easily launch their applications while looking at the documents.

The improved memory management has the unpleasant side effect of making almost every current Windows program not work. Although some publishers had new versions available when Windows 3 was released, numerous others said that their upgrades won't be ready for many months.

Microsoft made some efforts to overcome this problem by giving Windows 3 a mode that will run old programs. However, it is very difficult to run both old-style and new-style Windows programs at the same time, be-

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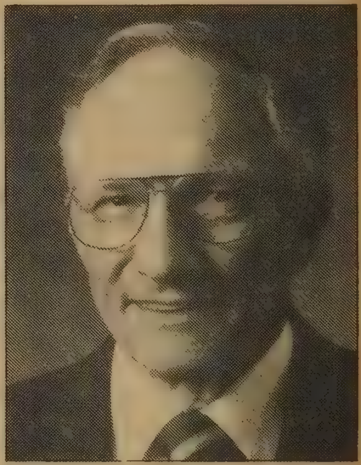

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The press pundits who claim that using Windows 3 is just like using a Macintosh either haven't used a Macintosh much or didn't use much of Windows.

cause old-style programs need expanded memory but new-style ones need extended memory. Microsoft is banking on the fact that most Windows users up to now generally only used a single Windows program.

One big improvement that comes from the new version's better memory management is that it now works much better with networks than Windows 2 did. Still, Windows 3 programs are not that fast unless you have an 80386 or 80486. ToolBook, the HyperCard-like runtime package that comes with Windows, is fairly sluggish on a 12MHz 80286, even with 2Mb of RAM.

All new software has bugs, but only Microsoft could get away with releasing software that causes hard disks to crash or not be recognized and get away with it. Windows 3, when running on an 80386-based system, interacts badly with hard disk utilities that partition the hard disk, and may cause significant data loss.

The vast majority of MS-DOS users use version 3, since version 4 takes up much more memory and does not run on many clones. However, version 3 cannot handle disks larger than 32Mb. Thus, users of version 3 often use third-party disk partition systems to give them partitions larger than 32Mb. Windows 3 often causes severe damage to the file allocation tables (FATs) of disks with such partition software, causing total data loss. Microsoft cavalierly claims that you should use MS-DOS version 4 if you want larger partitions, even though it doesn't run reliably on many systems.

To make matters worse, Microsoft admits that it knew about the incompatibilities before Windows 3 was released but never told anyone. There is no mention of the problem in the release notes that come with Windows 3, and Microsoft didn't even tell the manufacturers of the partitioning software. According to Microsoft, "We knew certain partitioning methods caused problems for Windows," but they decided not to publicize the problem.

Apparently the problem can be partially alleviated by using a temporary (instead of permanent) swap file, but even in that case damage can be done.

What It All Means: Although the hoopla for Windows 3 sounds a great deal like the misplaced excitement that Microsoft generated for earlier versions of Windows and OS/2, many more software companies are committed to producing Windows applications by the end of this year.

Microsoft itself is the biggest manufacturer of Windows software, and the current versions of Excel and Word for Windows work under Windows 3. Aldus has promised that PageMaker, another important Windows application, will be updated by July. New Windows applications are expected from Lotus, Adobe, and Informix.

It is likely that most of these companies will see much larger sales in the Windows market than in OS/2. OS/2 has been moribund for many months, and many developers have said that it is so much easier to develop for Windows than it is for OS/2 that it is unlikely that OS/2 will catch on for many years.

Of course, it is still not clear that Windows will catch on either, but its much more serious support from software developers gives it a much better chance than it ever had before. People who were disillusioned with Windows 2's limitations will be pleased with many of the improvements in version 3.

The first noticeable change is the much better setup program. The Windows 2 setup program was so bad that many people could not use it at all. The new setup is significantly better and less daunting to new users. The Program Manager and File Manager will make it less likely that people will leave Windows to perform normal file management tasks. The bundled applications are also better and easier to use.

Microsoft is betting that the tens of millions of PC users who have 640K or 1Mb machines will upgrade to at least 2Mb. Although Windows 3 will work on a 286-based machine with 1Mb, most software publishers are saying that they will require two, because Windows itself eats up most of the first megabyte. Adding memory to a PC is not terribly expensive (RAM is now selling for $70 to $110 a megabyte), but most PC users do not want to open their PCs. Even those who are willing to open them are unwilling to risk pressing chips into sockets or even to change boards. Since few PCs weigh less than 25 lbs., many users will be hesitant to drag their machine into their dealers and leave them there for a few days or even overnight. Although the memory upgrade issue was passed over by Microsoft as minor, it may significantly slow the acceptance of Windows. Even today, most of 80286 and 80386 systems sold come with only 1Mb of memory, and many require an additional memory board to add more RAM.

Windows itself is a lot more fun than plain old MS-DOS. It always has been, but that has not been enough to get users to adopt it. The only reason most people bought Windows was that Windows applications like Excel and PageMaker required it. With more Windows applications appearing this year, more people will feel compelled to spend the money to buy it.

Some programs just won't work with Windows, such as TOPS networking; in order to run some popular programs like Lotus 1-2-3 version 3 on an 80386-based system, you have to use a less-powerful mode of Windows. There will be a fair amount of pressure on the developers of such programs to make them compatible with Windows. Although it will not be a "necessary" part of running MS-DOS for many years (if ever), it will certainly become a significant part of the computer scene, and will probably make life easier for tens of millions of users in the next few years.

If you are interested in Windows 3, check to see whether you have a copy of Windows 2 anywhere. You may have gotten a complimentary copy when you bought a Microsoft Mouse or other hardware. If you have any Windows application, you have a copy of Windows 2. This lets you upgrade to Windows 3 for $50 (plus $5.50 shipping). Call (800)323-3577 and have a credit card ready. Microsoft has special upgrade rates for corporate customers. The upgrade offer is only good until September 15.

COMPUTER BOOKS FOR THE YEAR

Once a year, the American Booksellers Association gathers all the publishers to show off the books that you will see in the next year. This year's show, in Las Vegas, did not bode well for buyers of computer books.

Very few new ideas showed up at this year's ABA convention. Many publishers are so busy turning out books for every level of user of all the popular programs that they haven't done much to move out of their established

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Apple Mac 2400 bd Modem	275
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Laser II NT	3099
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Apple RGB Monitor	699
1 MB Memory upgrade	85

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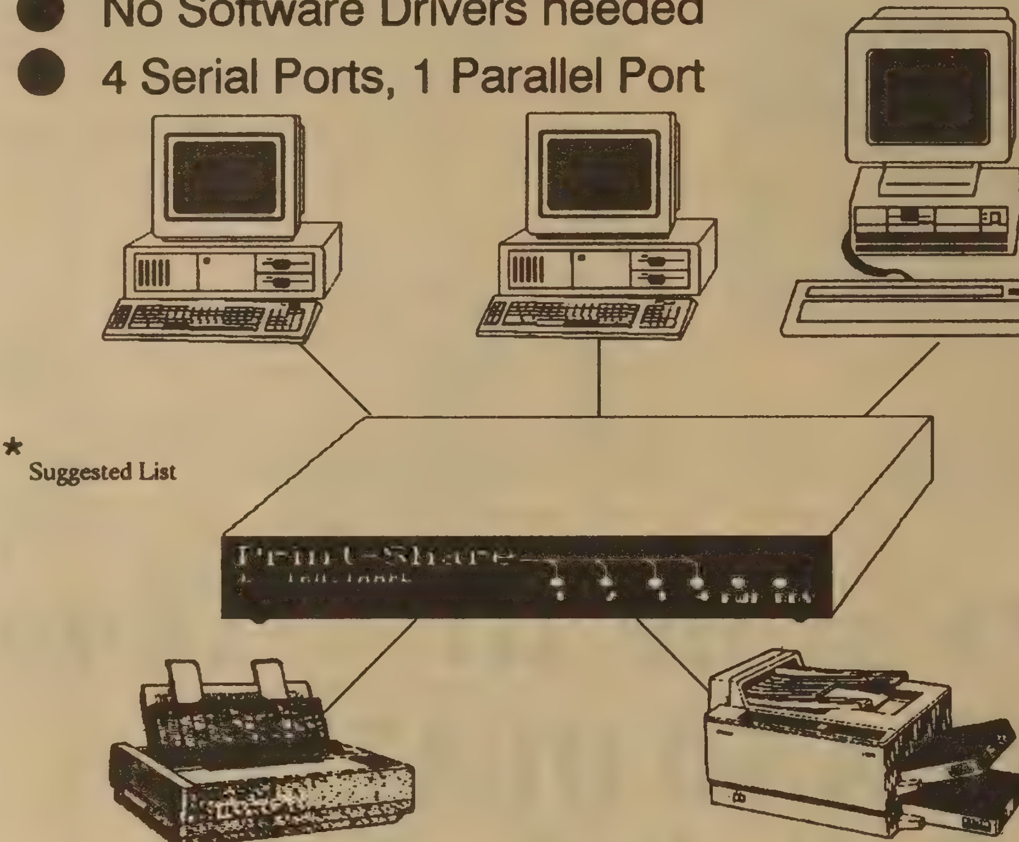

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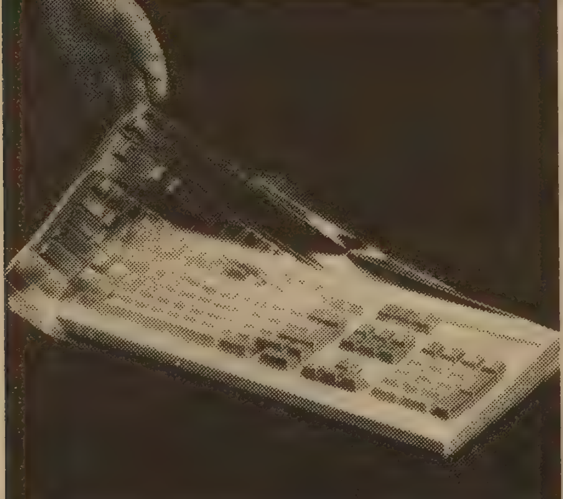

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series. The past year has not created many new best-sellers, so most of the publishers didn't try to find any new methods to get computer book buyers in different forms.

Of course, Windows 3 books are all the rage, and will continue to be for at least the rest of this year. There will be at least a dozen books on the basics of using Windows 3, and another dozen "power users" guides. Given that Microsoft made a good effort and greatly improved the documentation that comes with Windows 3, it is not clear how well these books will sell.

A few publishers will also have books on programming with Windows 3.

Microsoft Press has the most books for Windows and is the only publisher to be able to call its books the "official" guides. Microsoft Press also has the distinction of starting the only major innovation of the year, books that come with demonstration versions of the software they talk about. Following up on Microsoft's successful "Learn xxx Now" series, these "special editions" come with disks containing crippled demonstration versions of the software, so you can follow along with the tutorial in the book even if you don't own the product. For about $30, people who are not sure whether or not they want to buy a product can test it and, if they decide to buy it, already have a good introductory book on it. Given that Microsoft is notorious for incomplete manuals, this reduces fears of potential buyers about buying the full package.

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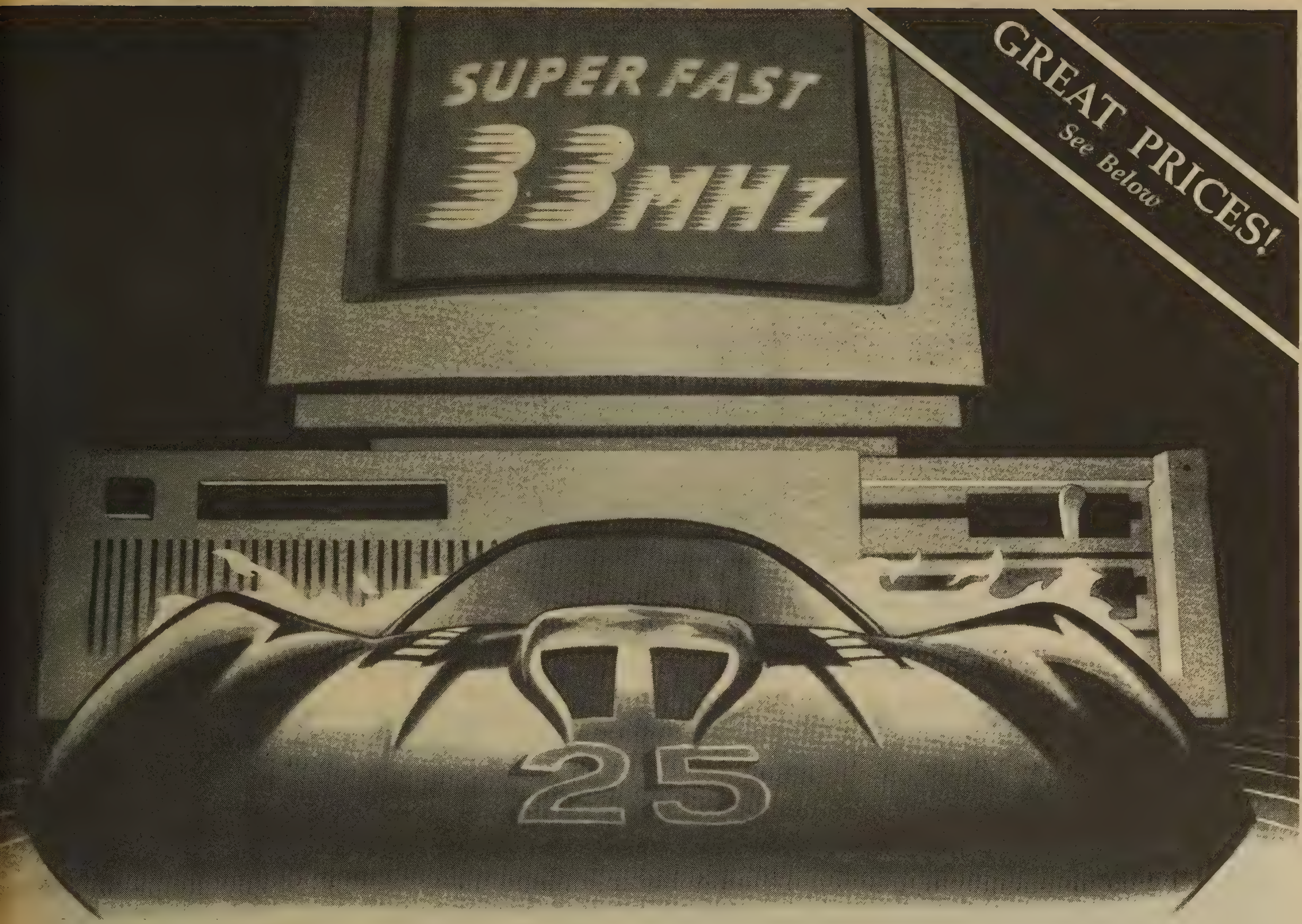
Other publishers are also rediscovering book-disk combinations. After last fall's best-seller by John Dvorak, *Dvorak's Guide to PC Telecommunications,* many companies that had tried



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- Enhanced keyboard
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book-disk combinations once or twice and given up on them rediscovered their appeal. Early book-disk combinations were aimed only at programmers, but many companies have now released sets that are useful to a much wider variety of readers. The recent announcements, which will be released at various times in the next few months, include the Waite Group's *Master C: Let the PC Teach You C, Dr. File Finder's Guide to Shareware* from Osborne/McGraw-Hill, and *Windows 3 Programming Primer* from Addison-Wesley.

Bookstores have steadfastly refused to sell non-book software for many reasons. Primarily, since they don't understand much about computers, they are hesitant to sell something that might require support. Most bookstores can't figure out how to categorize computer books in their computer section, much less sell and support software. The large chains like Walden's and Crown do sell a few select titles, but they don't plan on expanding much, since the software sales have been small and the inventory costs are high. The advent of book-disk software worries some bookstores but they hope that people are in fact just buying the book.

Since books require almost no "support," book-disk packages don't scare bookstores' buyers nearly as much as regular software.

Other books that do not fall into the yet-another-guide-to-some-software include the new edition of the *PostScript Language Reference Manual* (Addison-Wesley), the *Sim City Planning Commission Handbook* (Osborne/McGraw-Hill), the *Used Computer Handbook* (Microsoft Press), and a slew of books on Nintendo and other video game machines.

HITACHI DEVELOPS FIRST 8MB RAM CHIP

Leapfrogging over other semiconductor companies, Hitachi recently announced that they had developed a working prototype of a 64Mbit (8Mb) chip. In addition, they said that the chip used new technology to create circuit paths only .3 microns wide, much narrower than current production technology, and that the chip had been etched by electron beams.

Although production of this chip is years away, it could give Hitachi a huge boost in the market if they were the only supplier of RAM that is so dense. ■

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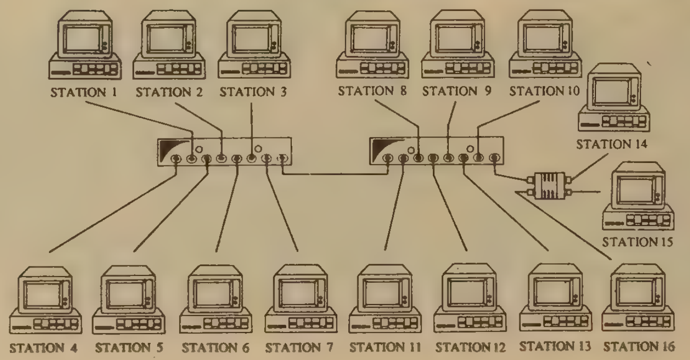
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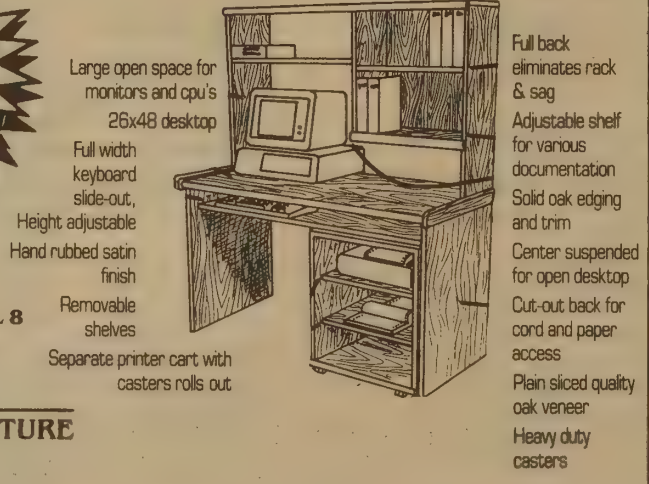
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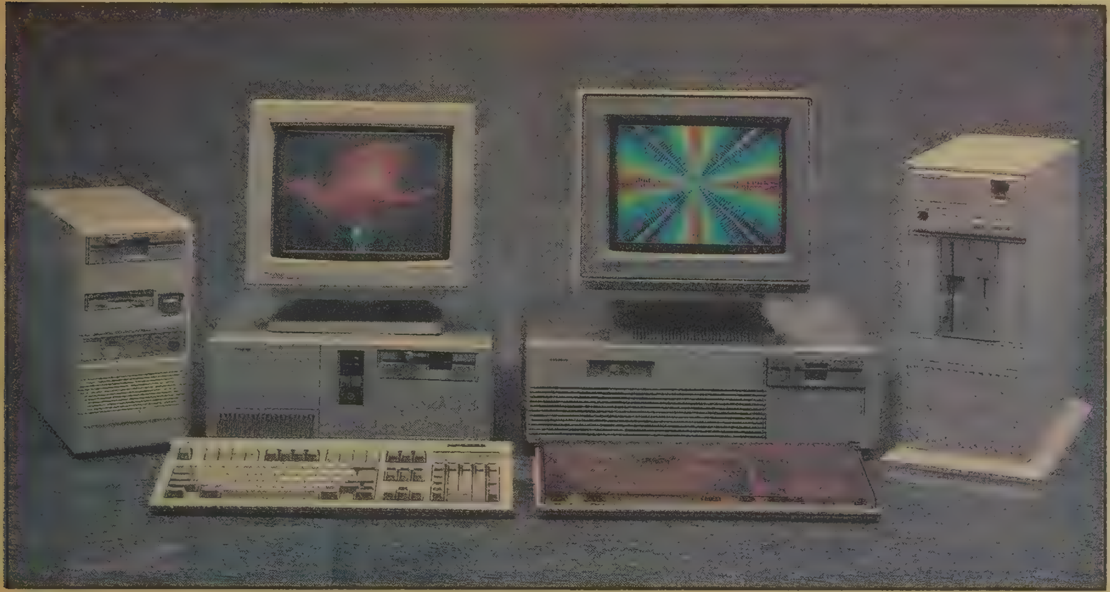

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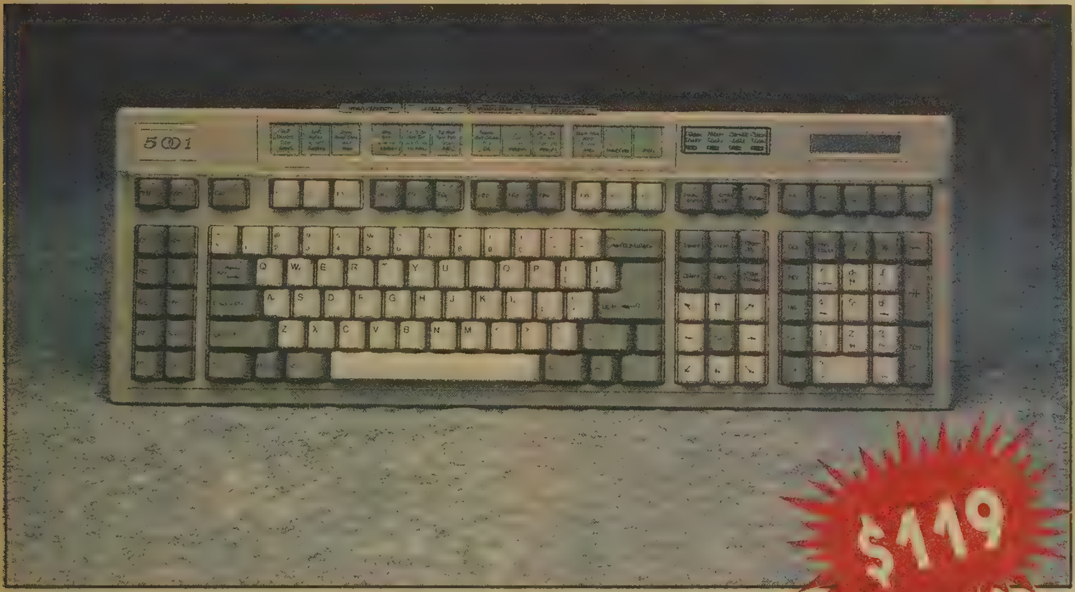

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LETTERS

TOO MUCH LAWYER-BASHING?

While lawyer-bashing is both popular and sometimes appropriate, I have to take exception to Paul Hoffman's column (#69). The judge in the litigation between Motorola and Hitachi may well have castigated the lawyers in the case since the judge had no one else available to address; however, it is not the lawyers who make the decisions when it comes to determining whether to settle a case or continue with litigation. That is a business decision left strictly to the principals, although obviously the principals will seek counsel's opinion. It is a violation of ethics, by the way, and grounds for malpractice, to fail to inform a client of a settlement offer.

Litigation is one of the worst business propositions in the world. No rational businessman wishes to pour money down the litigation rathole without good reason. Given the dollars at stake in the chip copyright infringement litigation, the decision to settle, to continue the litigation, or to appeal is one that could only be made at the highest levels of management and the board of directors.

> "Litigation is one of the worst business propositions in the world. No rational businessman wishes to pour money down the litigation rathole without good reason."

While there are certainly substantial fees to be made from the kind of major litigation that the Motorola/Hitachi dispute involves, any high quality reputable law firm today finds that it has all the business it can handle given the litigious nature of Americans in general. Let's put the blame where it belongs.

Plaudits to Jim Warren for his entertaining and thought-provoking columns. As to redistricting by algorithm, who is going to watch the programmers? Or are they immune to such mundane attractions as politics?

George M. Snyder
Huntington Beach

PHYSICS ALERT

Re your review of Interactive Physics: send Markowitz back to Physics 101. A free-falling object does *not* fall 32 feet the first second. It falls 16 feet. It accelerates 32 ft/sec^2.

$s=1/2at^2$.
$\therefore$ if t=1 sec, s=16 ft.
if t=2 sec, s= 64 ft.

from the start, not 64 ft. during the second second. What he's got is velocity, not displacement.

L.W. Jordan
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TANDY USER SEEKS HELP

Please refer me to anyone who can offer me support group assistance with my Tandy SX1000 computer and DMP430 printer.

Noting that I reside in the Southern California area of Anaheim, a support group in the local area would be most beneficial. Or perhaps you can refer me to an organization which can be instrumental in my desperate pursuit of help!

Peter Creanza
Anaheim

If any readers have any useful suggestions, we'll be happy to publish them.—eds.

AMIGA IN THE REAL WORLD

My son and I operate a desktop publishing (i.e. electronic prepress) business, and our hardware/software is based upon the Amiga 2000. Our equipment includes a 68020/20MHz CPU with MMU and math coprocessor running at 20MHz, 7 Mb of RAM, and an 11ms, 80 Mb GVP Quantum hard drive with DMA 64K fast-cache controller, FlickerFixer video card, and NEC MultiSync monitor. No sunglasses needed.

Our "meager" peripherals include an NEC LC890 laser printer, Canon IX-10 scanner, Supra 2400 baud modem, HP PaintJet printer, AMAX Macintosh emulator with drive, and a Sharp JX-100 color scanner.

In short, what we have here is an integrated, powerful, fast, fully IBM- and Mac-compatible system which supports the three main computer systems. Besides thousands of Amiga software programs, we can take advantage of IBM and Mac software as well.

Mr. Shrivastava [author of recent letter "Disgruntled Amiga User Strikes Back"] suffers from the same MacDisorder most MacPeople suffer from: MacBlindness. He knows nothing about the Amiga and understands less. He knows nothing about IBM clones and understands even less about them. I suggest he leave the safety and exclusivity of his college-buffered yuppie world and discover that other viable computer systems do indeed exist.

I use my computer because it is the tool for the job. Period. I don't care what you do with your computer. I say enough of this stupid insipid competition! Use what you wish. Let's be friends. Of all people, we should know better than to compete. We have much knowledge. We wish to share it. Will you?

Steve Muchmore
The Graphics Shoppe
Claremont

UNIX MAIL: NO OFFICE SHOULD BE WITHOUT IT?

In your April 16th issue you ran an article about installing QuickMail on a Macintosh. In the article it implies that setting up electronic mail (email) on a UNIX computer is a very difficult task. This is not true. Under UNIX, electronic mail is part of the operating system, not an application you have to buy and install. On a standalone UNIX computer, sending mail on the local system requires no setup; you just send mail to the user's account. There are no restrictions on the num-

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65 MB	3419	3518	3829	4009
110 MB	3609	3708	4019	4199

386-25 MHz

LANDMARK = 33
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- REAL TIME CLOCK W/ BATTERY BACKUP
- 1.2 MB FLOPPY DRIVE
- 1:1 2FL/2HD CONTROLLER
- 200W P/W CASE HOLDS FIVE DRIVES
- 101 ENHANCED KEYBOARD

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HD	NO MONITOR	MONO	VGA	SUPER VGA
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LANDMARK = 43
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- SOCKET 80387 & AMI BIOS
- 1X32 BIT, 5X16 BIT, 2X8 BIT SLOTS
- REAL TIME CLOCK W/ BATTERY BACKUP
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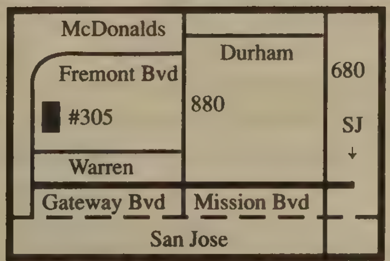

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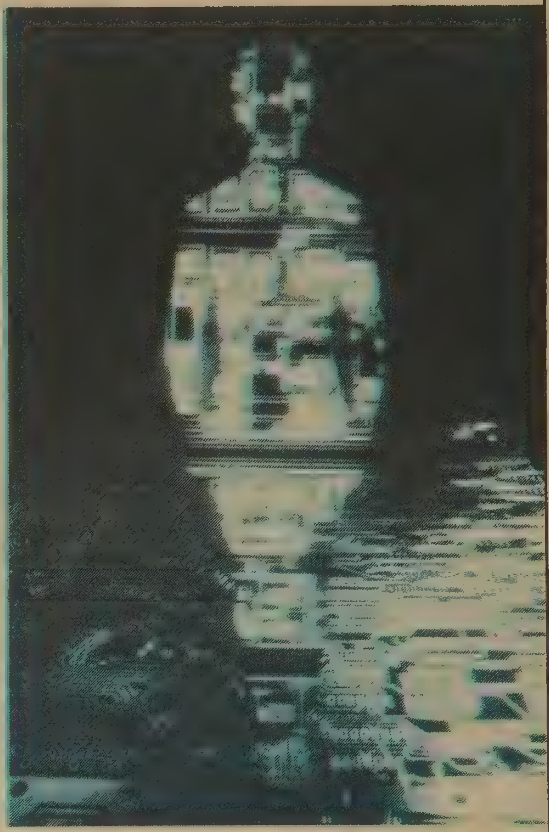

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> "Ease of use is an important issue, and is coming to UNIX with the X windowing system, but it is not the only issue. Connectivity with other people and other companies makes the email system much more powerful."

ber of users that can use it. If you are setting up email on a network of UNIX computers, or setting up a link to the international Usenet/Internet community, there are a few steps involved, but it is really quite straightforward: attach a modem, edit a few files, and establish a link to a Usenet neighbor. With this you have access to one of the largest email communities in the world, and all for the cost of your phone call.

Admittedly UNIX is not icon-based (yet), and you do have to know how to use an editor in order to set it up, but the connectivity of the Usenet/Internet community is immense. What other email system allows you to send mail to almost any employee of most of the major computer companies, such as Apple, Sun, DEC, and AT&T? What other email system allows you to send mail to almost any student or researcher at most colleges, universities, and research centers? Again, all this for a phone call and some good will on the other end of the link.

Ease of use is an important issue, and is coming to UNIX with the X windowing system, but it is not the only issue. Connectivity with other people and other companies makes the email system much more powerful. Imagine being able to send electronic mail to any other person from your computer—just like dropping a letter in the mail box—but with electronic delivery speed. The rest of the world will become a little closer.

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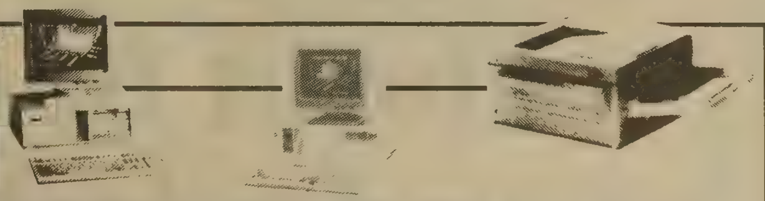

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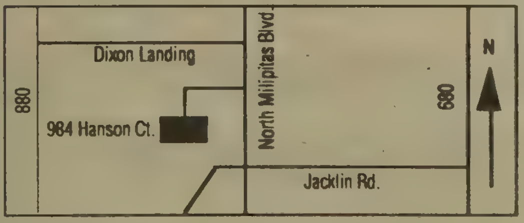

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About Backup, Freedom, And Mitch Kapor

BY JIM WARREN

REALIZABLE FANTASIES

Copyright © 1990 by Jim Warren. All rights reserved. *Jim Warren founded* InfoWorld, *the DataCast proposal for broadcast-based paperless electronic newspapers, Video Initiative, Wireless Digital, Initiative, Inc. and the nation's largest public microcomputer convention. He was founding host of PBS television's "Computer Chronicles" series, founding editor of* Dr. Dobb's Journal, *founding president of the Microcomputer Industry Trade Association and has chaired various computer professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics.*

Perhaps the most notable aspect of "personal" computing is that individuals can configure their tools to meet personal desires, more than with any previous technology—including minis and mainframes.

Personal computers permit the adjusting of tools to people, rather than the adjusting of people to tools. As it should be!

Let's discuss how to do it.

BACK UP, BUDDY!

What do you need for backing up your files and disks?

I just spent a week archiving about 200 floppies, plus backing up 400+ megs of hard-disk files—containing numerous duplicate files and near-duplicates. I used Retrospect for the Mac (from Dantz Development in Berkeley, 415/849-0293). It's the best archiving tool I've ever used.

But, like Oliver Twist, I—of course—want more. (After all, that's what this column's all about.) After the past week, plus 23 earlier years of "innovative backup errors," here's my ultimate backup/archiving system—major aspects of which are already reflected in Retrospect.

MINIMIZE LIMITS; PRESUME VARIETY

Set size constraints only by the memory and storage limits the software finds on a user's system. Users may have—or add, or remove—gigabytes of storage, fixed and removable rotating and tape media, numerous subsystems, masses o' memory, full-figured filenames, colorful icons, etc.

Make minimum assumptions about what recording media will be used for the source and target. *Don't* assume backup will be on floppies.

Allow for the differing peculiarities of fixed and removable disks, big and li'l' disks as sources and as targets, formatted and unformatted media, MO (magneto-optical read/write) and WORM (write-once/read-many) laser disks, and addressable and non-addressable tape—including 9-track reels, 3M-type cassettes and helical-scan tape (standard VCR, 8mm videotape, and 4mm DAT—digital audio tape).

Allow for orderly source and target error recovery during backup—especially from common events such as inserting or ejecting incorrect disks, disk-full conditions, write-lock and not-formatted events, etc.

Allow multiple sources to be specified in a single backup or archiving session.

For each session, allow the user to specify how many copies of a file, or folder (subdirectory) or logical disk are to be made, and in what order (file by file, folder by folder, session by session), and on what target media—which may be multiple and dissimilar (e.g., tape and MOs, floppies and a Winchester, etc.).

Allow the user to specify whether to data-compress files—by file, folder or session—and which compression technique to use. (Typically, compression routines are reasonably fast and cut file-size in half or better.)

Ditto for encryption. Offer simple encryption and DES (government-specified Data Encryption Standard). When requesting the password or key for each encryption, allow the user to see or suppress its display as they enter it. If they wanna see it, and risk letting others see it as they type, let 'em!

BACKUP VS. ARCHIVING

Allow for *backup*—where the current source contents are saved on the target. Leave the source intact, modifying no more than perhaps its backup dates—with user's permission.

Save the source file directory—as well as its files. This permits automatic reconstruction of the source's contents, including directory structure—even if it involves thousands of files.

For backup, old versions of files and directories on the target may be replaced with their current versions from the source—especially if the user wishes to minimize the media required for backup.

Replacing or retaining old copies is the difference between backing up and archiving—but it has numerous ramifications. The next column will address archiving issues.

OPINION: KAPOR'S RIGHT ON

An editorial—pretending to be the lead news article on *ComputerWorld*'s front page (6/4/90)—ripped Mitch Kapor, who dared to propose creating a legal defense fund "for hackers targeted

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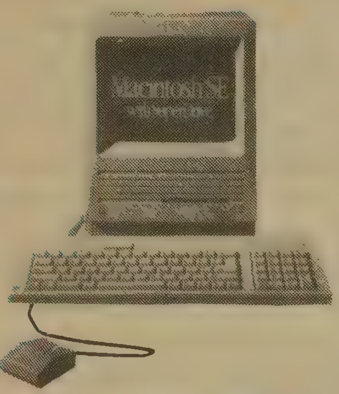

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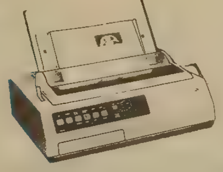

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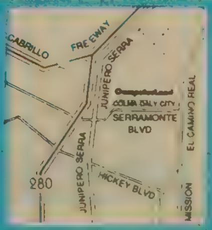


PONTIFICATE YOURSELF

Send suggestions to Jim Warren, Realizable Fantasies, 345 Swett Rd., Woodside, CA 94062. Published proposals will be attributed to their authors unless anonymity is requested.

by federal investigators"—even though he absolutely is not proposing to defend convicted computer crackers. (Mitch founded Lotus and On Technology.)

The *CW* hit piece—which opened with, "Say it ain't so, Mitch!"—later succumbed to journalistic principle, mentioning that the fed's targets were *alleged* hackers whose property—apparently computers?—had already been taken by agents "in a federal computer crime sweep."

After the "article" trailed off to page 123, it even got around to reporting Mitch's side of the issue—quoted *indirectly* from the *Washington Post*: "It's plausible there's a witch-hunt going on. I'm concerned that hackers' civil liberties are being violated. I'm concerned these kids [the unconvicted hackers] aren't getting a fair shake in the legal system. They don't have access to legal counsel that would let them adequately defend their rights." In the 13th of its 16 paragraphs, it even mentioned that, "Kapor reportedly said he feels that bulletin boards promote technological innovation and that the prosecution will have a 'chilling effect' on the free flow of information."

Also quoted—on page 123: Arizona Assistant Attorney General Gail Thackeray, who coordinated the federal "computer crime sweep," saying, "We've arrested the evidence [! ?]. The only legal argument these people have is whether they are entitled to the return of their property."

THE PRESS VS. CIVIL LIBERTIES

Folks, this does *not* concern protecting convicted computer crackers against judicially-imposed penalties. (If they are guilty, let it be proven in a court of law, and let the court impose the penalties.)

This concerns the too-easy presumption of guilt—unless innocence can be proven. This concerns the seizure of property, taken and held by armed government agents—until such police-imposed penalty can be proven in court to be invalid. This concerns citizens being assured the full "due process of law"—even if they don't know what it means and have a tiny fraction of the financial and staff resources available to the prosecution.

And, this concerns a too-docile Press: too unquestioning of "authority," too unconcerned about civil liberties, offering opinion and bias under the guise of—and in place of—objective, balanced news reporting.

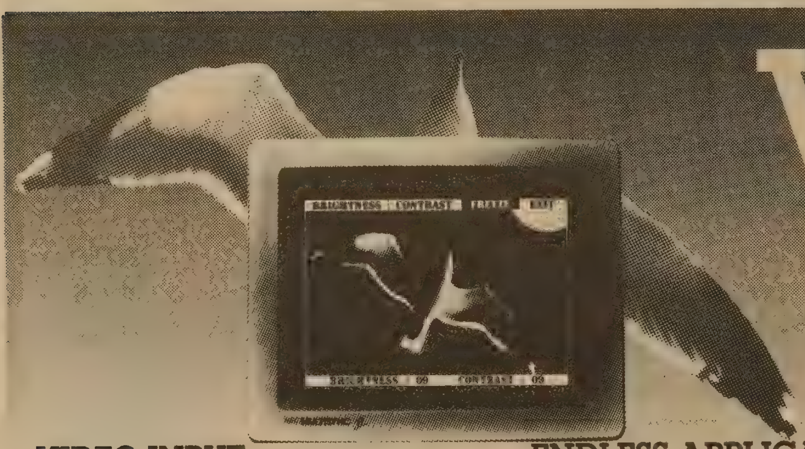
The Constitution does *not* guarantee our civil liberties, nor our protection again illegal search or seizure. It merely *lists* the protections (as do constitutions in some outrageous dictatorships). We, as individual citizens, are freedom's only guarantors—and we desperately need a wary, vigilant free Press.

Citizen Kapor placed his resources on the line to help guarantee what the Constitution merely proposes. My fantasy is that others—and the Press—will also protect those fragile freedoms.

QUICKIES

When asked to recommend a magneto-optical drive, Tovar commented: "Well, make sure the fan's going in the right direction."

To dip your toes into the CD-ROM pond, without taking a bath, grab a NEC CDR-35 CD drive. Though a little *sloowww*, it's the cheapest CD-ROM drive on the market—as low as $469 (*MacWeek*, 6/5). Further, a button releases it from its dock. Snap on a battery and have a Walkman-style player for your music CDs. Neat low-cost, multi-use design. ■



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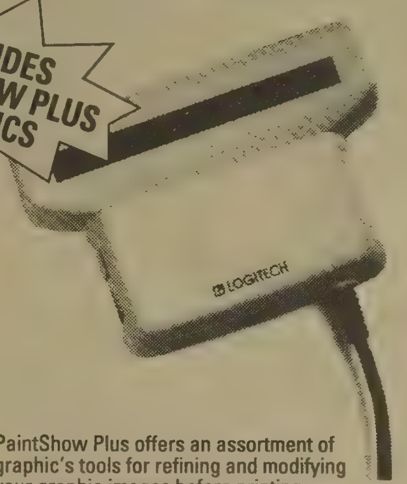

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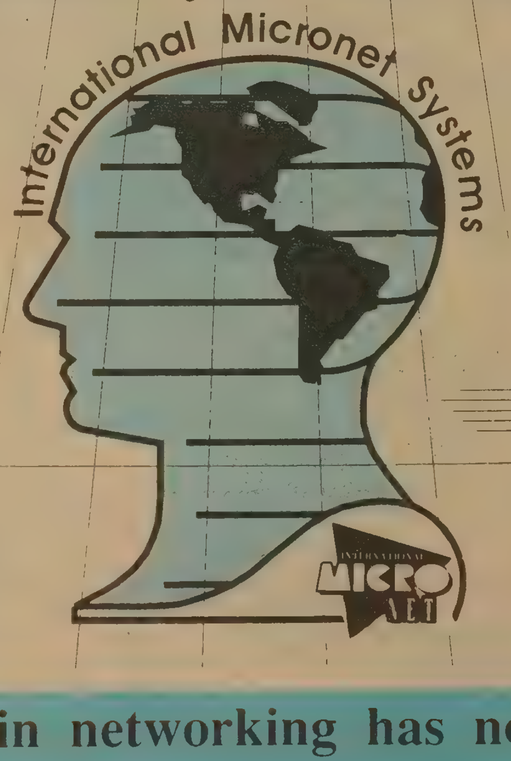

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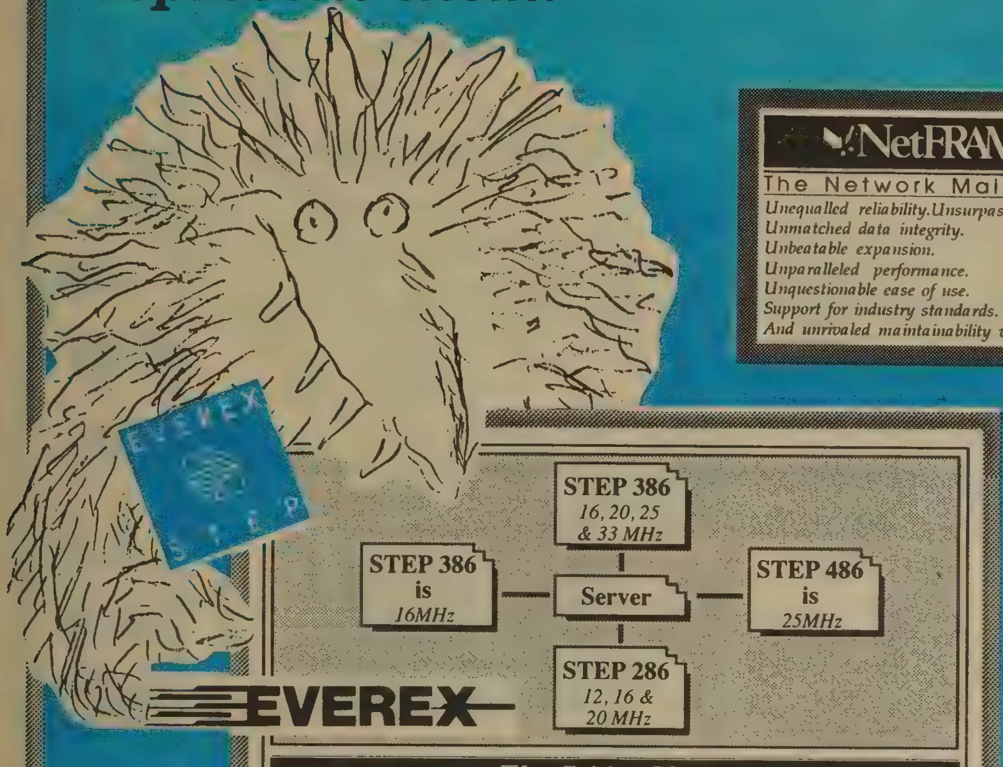

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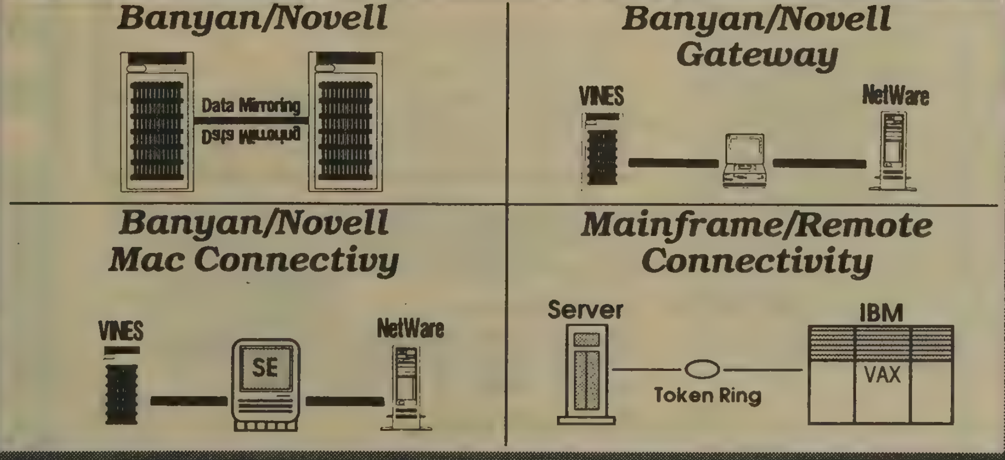
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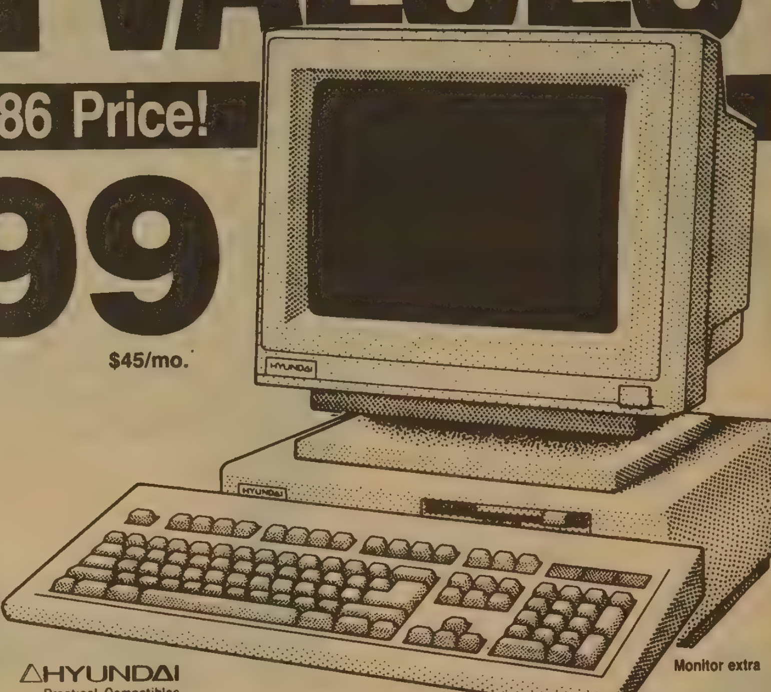

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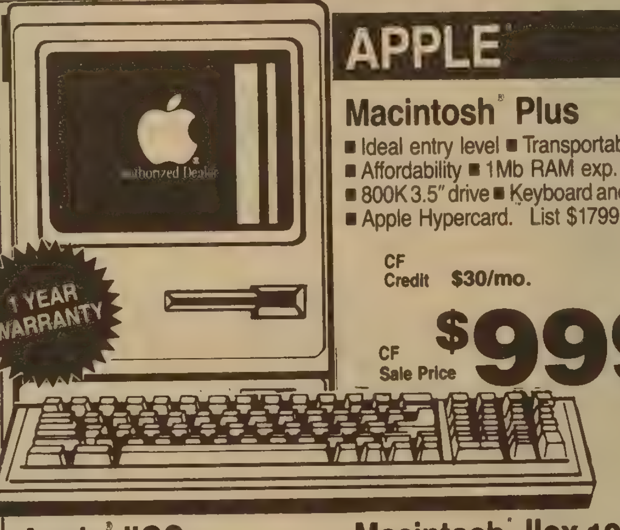

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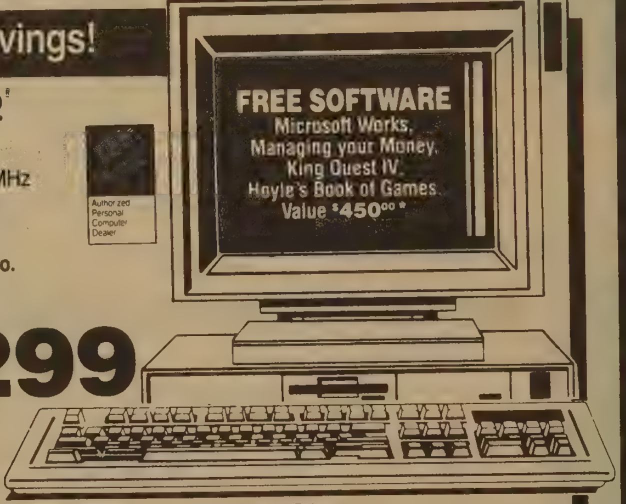

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BUSINESS SOLUTIONS

Managing Data In Your Business

SQL Systems: What You Need To Know

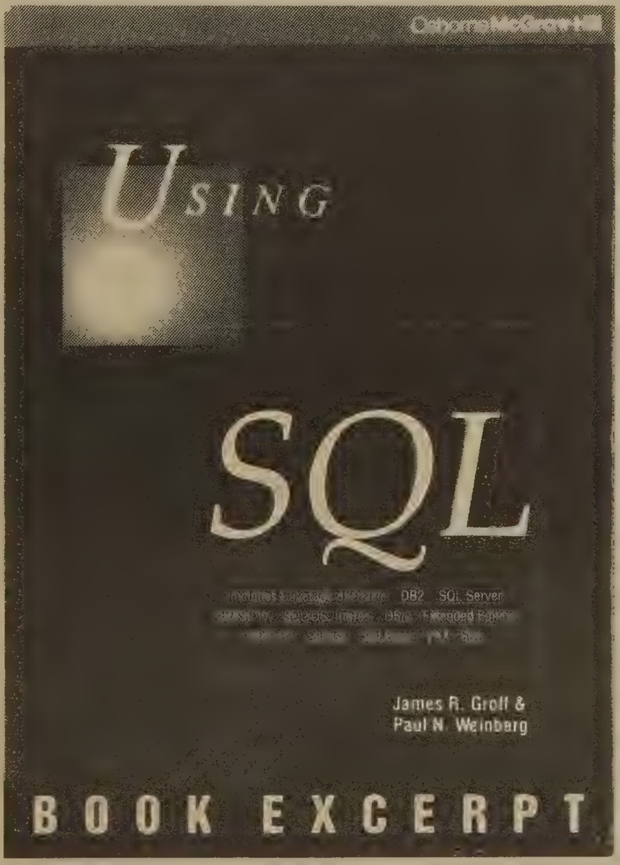
BY JAMES R. GROFF & PAUL WEINBERG

Still considered a somewhat arcane concept, Structured Query Language is emerging as an important standard in powerful relational databases. Whether your business's data processing needs are currently being handled by PCs, networks, minis or mainframes, chances are there's a SQL-based system in your future even if you're not using one now.

Using SQL, by James R. Groff and Paul Weinberg, offers a thorough discussion of the subject from its theoretical underpinnings to its current applications, from programming tips to the strengths and weaknesses of existing products on many platforms. If you work in the database area, the book is an indispensable resource and reference.

SQL is one of the most important technologies driving and shaping the computer market today. From its first commercial implementation a little more than a decade ago, SQL has grown to become the standard database language. With the backing of IBM, the blessing of standards bodies, and the enthusiastic support of DBMS vendors, the evidence clearly shows the importance of SQL:

- IBM's flagship databases, on systems from mainframe processors to personal computers, are all based on SQL.



By James R. Groff and Paul N. Weinberg from Using SQL, *published by Osborne/McGraw-Hill, 2600 Tenth St., Berkeley, CA 94710, 1-800/227-0900.*

DBMS Vendor Profiles

This [article] contains profiles of some of the leading vendors of SQL-based DBMS products. The vendors are leaders in their respective market segments in terms of either technology or market share, and collectively are responsible for 75 percent or more of SQL-related revenues. These vendors and their products are:

- Ashton-Tate (dBASE IV, SQL Server) *See page 34*
- Digital Equipment (Rdb/VMS, VAX SQL) *See page 38*
- Gupta Technologies (SQLBase, SQLWindows) *See page 38*
- Hewlett-Packard (HPSQL) *See page 40*
- IBM (DB2, SQL/DS, SQL/400, OS/2 Extended Edition) *See page 40*
- Informix Software (Informix-SQL) *See page 166*
- Ingres (Ingres) *See page 168*
- Microsoft (SQL Server) *See page 170*
- Oracle (Oracle) *See page 174*
- Sybase (Sybase SQL Server) *See page 174*
- Tandem (NonStop SQL) *See page 176*
- Unify (Unify, Accell) *See page 180*

- Every major independent DBMS vendor and most computer hardware manufacturers either offer or plan to offer SQL-based products.
- SQL-based databases are beginning to dominate in virtually every market segment, from personal computers to OLTP systems.
- The largest PC database vendor, Ashton-Tate, has bowed to market pressure and grafted SQL onto its dBASE IV product.

This chapter describes the current trends in the database market and the impact that they will have both on SQL and on the computer market of the 1990s.

DATABASE MARKET TRENDS

As the 1990s began, the size of the market for database management products crossed the three billion dollar mark, and forecasters predicted continued healthy growth throughout the decade. At the same time, the neat divisions that characterized the database market of the 1980s were rapidly fading. DBMS products could no longer be clearly categorized as "PC databases," "minicomputer databases," "OLTP databases," "mainframe databases," and so on, each participating in its own market segment. Instead, standardization on SQL and the relational database model created a new, more unified database market.

These changes in the market have produced dramatic changes in the fortunes and marketing strategies of DBMS vendors. To be successful, a DBMS vendor must provide SQL support and then provide additional value-added on top of SQL. Established DBMS vendors whose products are not based on SQL are scrambling to provide SQL support and hold on to their installed base of systems. The experiences of Ashton-Tate in the PC market and Cullinet in the mainframe market show how this phenomenon has cut across all segments of the database market. Meanwhile, DBMS vendors who already have SQL-based products are taking advantage of the opportunity, attacking both established vendors and each other.

The battle lines are particularly well drawn in two segments of the computer market. In the transaction processing segment, the major hardware vendors (such as IBM, Digital, and Tandem) have all introduced OLTP systems based on relational databases (DB2, Rdb/VMS and NonStop SQL, respectively) competing with independent DBMS vendors (such as Oracle, Ingres, and Sybase) who tout transaction processing versions of their products. In the personal computer segment, the advent of OS/2 has produced a clash between the hardware giant (IBM, with OS/2 Extended Edition), a coalition of personal computer giants (Microsoft, Ashton-Tate, and Lotus with SQL Server), and the largest independent DBMS vendor (Oracle with Oracle Server for OS/2) for dominance of the desktop.

As the experience of these two market segments shows, the rise of SQL has produced a dramatic reorientation of the database market, which is still in progress. Competition based on market segment is giving way to

The rise of SQL has produced a dramatic reorientation of the database market. Competition based on market segment is giving way to competition based on other factors, including performance, portability, and support.

ASHTON-TATE CORPORATION

Ashton-Tate is the leading vendor of personal computer database products. Its dBASE II and dBASE III products have sold over two million copies, and they have consistently held a 70 percent or greater share of the PC DBMS market during the 1980s. Both dBASE II and dBASE III were basically flat file managers with a limited ability to join data across multiple files. Even though these databases were limited, the dBASE programming language was used to develop a wide range of business applications on PCs, and has become a de facto standard.

By the late 1980s, minicomputer DBMS vendors had ported their products to personal computers and began to exert competitive pressure on the aging dBASE product line. In addition, competitors in the personal computer market offered more advanced products. Ashton-Tate responded with dBASE IV, which was designed to provide backward compatibility with earlier versions of dBASE while providing the more advanced features that users were demanding. In addition, dBASE IV featured SQL support "grafted onto" the dBASE language. Finally, dBASE IV was to provide a front-end for SQL Server, the OS/2 version of the Sybase DBMS.

Unfortunately, the initial release of dBASE IV had some serious bugs, and Ashton-Tate's engineers discovered that all of the objectives for dBASE IV could not be achieved within the 640KB memory limitation of MS-DOS. The product was revised and has been reintroduced in two versions. The stand-alone dBASE IV product runs on a standard IBM PC and supports both dBASE and SQL statements that access a local database. The network dBASE IV product requires an MS-DOS memory extender. It supports the same language statements as the stand-alone version, and it provides access to SQL Server databases across an OS/2 local area network.

Ashton-Tate and Microsoft share marketing responsibility for the SQL Server DBMS in the OS/2 market. Ashton-Tate initially had exclusive retail distribution rights for the product and was responsible for selling it in volume through computer stores along with its other database products. With the very slow initial sales of OS/2, however, the product has been less than spectacularly successful, and Microsoft has sought out other retail distribution channels for the product.

Ashton-Tate's current revenues are in the $400 million range. The company still holds the largest share of the PC DBMS market by virtue of its installed base of dBASE users, but it faces a major challenge to maintain that position in the face of competitive pressures from IBM, other PC DBMS vendors such as Borland, and full-line DBMS vendors such as Oracle Corporation.

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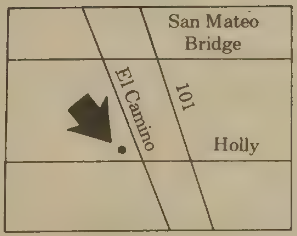

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competition based on other factors, including:

- DBMS features and SQL extensions
- transaction processing performance
- portability across multiple hardware platforms
- DBMS vendor reputation
- distribution channels
- support and service

With the changing competitive landscape, it seems very likely that some of the leading DBMS vendors at the beginning of the decade will no longer be leaders at the end of the decade.

HARDWARE PERFORMANCE TRENDS

One of the most important contributors to the rise of SQL during the 1980s was a dramatic increase in the performance of relational databases. Part of this performance increase was due to advances in database technology and query optimization. However, most of the DBMS performance improvement came from gains in the raw processing power of the underlying computer systems.

For example, with the introduction of DB2 Version 2, IBM claimed performance of 270 transactions per second (tps), up 120 percent from 123 tps for the previous release of DB2. However, a closer examination of the benchmark results showed that the performance of the DB2 software itself improved only 51 percent, from 123 tps to 186 tps. The remaining 69 percent of the performance increase was due to the more powerful mainframe on which the tests of the new DB2 software had been conducted.

The performance improvements in mainframe systems were paralleled in the minicomputer market, where the VAX 11/780 was replaced by VAXes with ten or twenty times its power, and in the personal computer market, where the Intel 8086 gave way to the 80286, 80386, and 80486. These hardware advances overcame the higher overhead of the relational data model and gave it performance comparable to the nonrelational databases of a decade ago.

The improvements in computer hardware price/performance should continue unabated through the 1990s, providing continuing performance improvements for relational DBMS products. Some of the most dramatic

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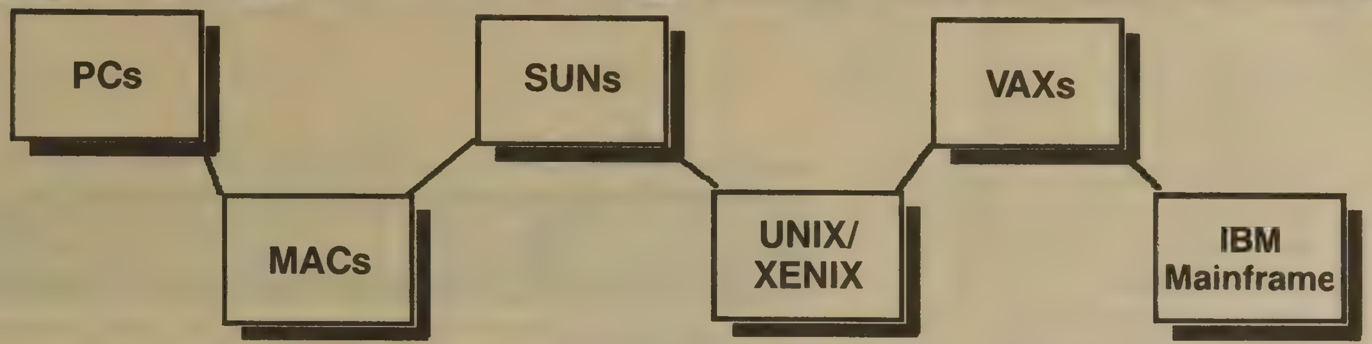

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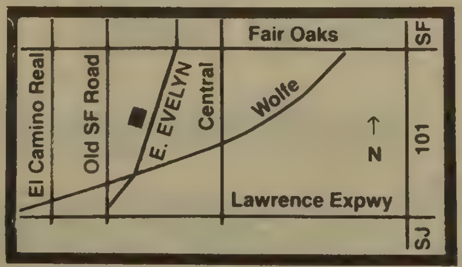

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advances are coming from multiprocessor systems, where two, four, eight, or more processors operate in parallel, sharing the processing workload.

A multiprocessor architecture is especially appropriate for OLTP applications, where the workload consists of many small, parallel database transactions. Traditional OLTP vendors, such as Tandem, have always used a multiprocessor architecture, but multiprocessor systems are now becoming part of the data processing mainstream. The largest mainframe systems already use a multiprocessor design, and multiprocessor systems are becoming an important part of the VAX minicomputer product line. These developments will drive down the cost of multiprocessor systems, further improving the price/performance of relational database systems.

Multiprocessor architectures pose a special dilemma for DBMS vendors who bypass the operating system in an attempt to improve database performance. The Sybase DBMS, for example, operates as a single process and takes responsibility for its own task management, event handling, and input/output—functions which are usually handled by an operating system such as UNIX or VMS. While this improves performance on a single-processor system, it prevents the operating system from automatically spreading the Sybase workload across multiple processors. To reap the advantages of a multiprocessor system, the Sybase DBMS software must be rewritten, duplicating the logic that is already in the operating system.

By contrast, DBMS products that do not bypass the operating sytem can automatically benefit from the multiprocessor environment. Oracle and Ingres both use this argument to defend their own architectures, and they point to benchmark results on multiprocessor systems as the proof of their claim.

Several companies are combining high-performance microprocessors, fast disk drives, and multiprocessor architectures to build dedicated systems that are optimized as database servers. These vendors argue

GUPTA TECHNOLOGIES, INC.

Gupta Technologies is one of the smaller relational DBMS vendors, but has an impressive list of technical "firsts" to its credit. The company was founded by a former manager of Oracle Corporation's microcomputer division. The Gupta product line includes a relational DBMS and database development tools, all aimed at PCs and PC local area networks.

SQLBase, the company's SQL-based DBMS engine, runs on MS-DOS or OS/2 based personal computers. SQLBase runs either on a stand-alone PC or on a local area network of PCs. In the latter configuration, the SQLBase server was the first and only major SQL-based server to run on an MS-DOS based PC. The server supports client PCs running on a NETBIOS-based local area network. SQLBase also provides a gateway to DB2, linking Gupta's PC products to mainframe data.

Other unique features of SQLBase include support for long data types ("blobs"), updatable scroll cursors, programmatic control over cursor isolation levels, and result sets, which allow the results of one query to be used as the data source for subsequent queries. The programmatic interface to SQLBase is through a callable API.

In addition to its database engine, Gupta offers SQLWindows, a collection of development tools that provide a graphical user interface for database processing. SQLWindows runs under Microsoft Windows and supports the development of "point-and-click" style database applications. SQLWindows works with Gupta's own SQLBase DBMS and also with other SQL-based back-ends, including OS/2 Extended Edition, SQL Server and Oracle Server. A version of SQLWindows that runs under OS/2 Presentation Manager is planned, and it will provide a similar graphical interface from OS/2 based PCs to a range of back-end database engines.

DIGITAL EQUIPMENT CORPORATION

Digital Equipment Corporation, the largest minicomputer vendor in the world, is also a major player in the minicomputer database market. Digital's VAX family of systems ranges in price and performance from personal VAX workstations costing under $10,000 to the VAX 9000 series, a mainframe-class system costing several million dollars.

The product line supports two different operating systems. VAX/VMS, the company's flagship operating system, is proprietary to Digital. Ultrix is an alternative UNIX-based operating system that is popular in engineering and scientific environments. In addition to its VAX architecture products, Digital markets a family of RISC workstations and a line of IBM-compatible personal computers.

Digital's flagship relational DBMS is Rdb/VMS, which runs solely under the VAX/VMS operating system. Internally the Rdb/VMS database engine supports the Digital Standard Relational Interface (DSRI), a low-level binary interface. Above the DSRI level, Rdb provides two language-based interfaces—VAX SQL, which supports embedded SQL and interactive SQL access, and RDO, which supports a proprietary Digital database language. The RDO language is slowly being phased out in favor of VAX SQL.

The Rdb/VMS DBMS itself provides only a basic set of database tools for system administration. To boost its offering, Digital licensed the Ingres tools from Ingres Corporation and modified them to support Rdb/VMS. Digital has also licensed the Ingres DBMS itself and offers it as the Digital-supported RDBMS under the Ultrix operating system.

In 1989 Digital bundled the Rdb/VMS run-time system with the VAX/VMS operating system, making it a fundamental part of the VMS operating software. Digital also indicated its intention to build other layered VMS products on top of the Rdb/VMS foundation. Remote access to Rdb/VMS data is provided by VAX SQL Services, a SQL-based API that uses DECnet networking protocols. SQL Services access is available from VMS and Ultrix-based workstations, from MS-DOS based personal computers, and from Macintosh systems. An Rdb/VMS add-on product, called VIDA, provides access to mainframe data stored in IDMS/SQL or DB2 databases.

> **Unfortunately, most of the benchmarks and the resulting data are designed to support vendor marketing claims rather than to enlighten users about DBMS performance in real applications.**

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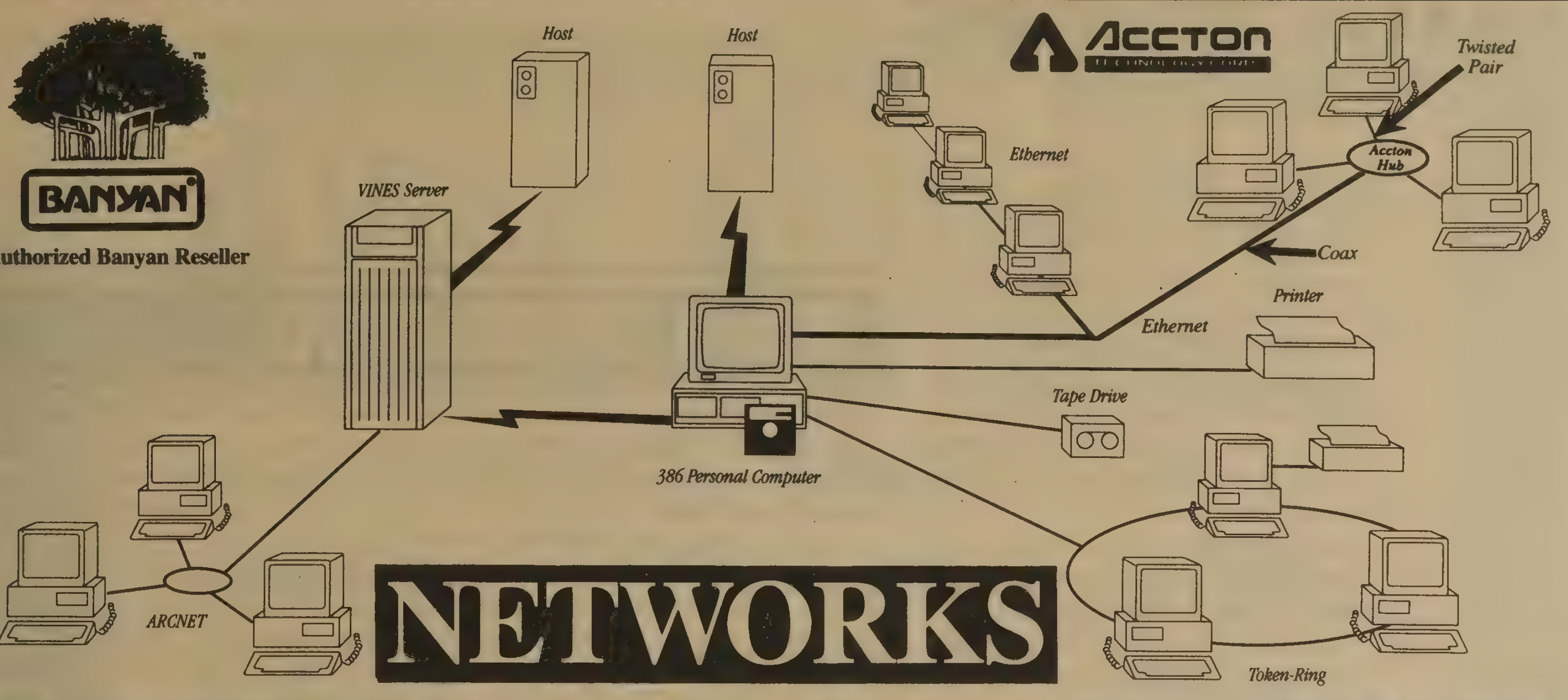
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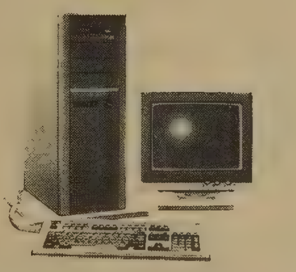

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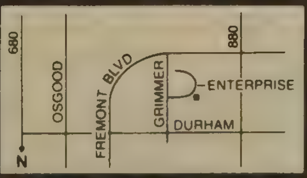
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that they can deliver much better database performance with a specially designed database engine than with a general-purpose computer system. In some cases, their systems include application-specific integrated circuits (ASICS) that implement some of the DBMS logic in hardware for maximum speed.

Dedicated database systems from companies such as Teradata and Sharebase (formerly Britton-Lee) have found some acceptance in applications that involve complex queries against very large databases. However, they have not become an important part of the mainstream database market. History shows that other application-specific systems (such as word processors) have had a very difficult time keeping up with the pace of technical advancement and the economies of scale in the general-purpose computer market. Dedicated database systems will have to overcome these formidable obstacles if they are to play more than a niche role.

THE BENCHMARK WARS

Relational databases and SQL have become part of the data processing mainstream, and they are being used to implement serious data processing applications. As a result, users are paying more attention to the performance of SQL products to ensure that their chosen DBMS won't "run out of gas" as their applications expand. This user concern, coupled with the DBMS vendors' interest in the lucrative transaction processing market, has produced "benchmark wars" among DBMS vendors. Virtually all of the DBMS vendors have joined the fray, each touting benchmarks that show the superior performance of its products while trying to discredit the benchmarks of the other vendors.

Unfortunately, most of the benchmarks and the resulting data are designed to support vendor marketing claims rather that to enlighten users about DBMS performance in real applications. Most of the benchmarks are vendor-proprietary, but two vendor-independent benchmarks have emerged. The Debit/Credit benchmark simulates simple accounting transactions. The TP1 benchmark, first defined by Tandem in 1985, measures a mix of typical OLTP transactions.

In a series of 1989 benchmark results, a multiprocessor Tandem minicomputer specialized for OLTP applications performed at 40 to 50 tps on a TP1 benchmark. Oracle's TP1 performance on midrange VAX systems ranged from 30 to 40 tps. Sybase performance on midrange VAX systems was also in

continued on page 166

IBM CORPORATION

IBM is the largest database vendor in the world, with database-related revenues exceeding one billion dollars. The majority of IBM's database revenues still come from two older, nonrelational, mainframe database products—IMS, a hierarchical DBMS, and DL/1 (Data Language/1), a hierarchical database access method. However, the fastest growing part of IBM's database business is in SQL-based relational databases, and SQL is the standard database interface under IBM's SAA strategy.

IBM has a SQL-based product offering for each of its four major systems families:

•DB2 is IBM's flagship relational DBMS product. It is a large, complex software product that runs on IBM mainframe systems under the MVS operating system. In its more recent releases, the performance of DB2 has improved dramatically, and IBM now markets it as an OLTP solution. However, DB2 is a substantial drain on mainframe resources and requires a sizable mainframe system to support it.

•SQL/DS is IBM's database management system for information center applications. It runs under the VM/CMS operating system on IBM mainframes. A fairly direct descendant of IBM's System/R relational database prototype, SQL/DS has pioneered some innovative relational database features, including extended dynamic SQL. However, from an IBM marketing perspective, it stands in the shadow of DB2.

•SQL/400 is IBM's SQL implementation for the AS/400 series of systems. The successor to the IBM System/38, the AS/400 has a built-in relational database system with hardware support as part of its operating system. SQL/400 runs as an additional layer, providing SQL support to the underlying DBMS software. To date, most AS/400's have been sold as upgrades to IBM System/38 and System/36 systems, and the SQL interface has not been critical to these customers. As the AS/400 begins to play its own independent role as a mid-range alternative to VAXes and other minicomputers, SQL support will become more critical.

•OS/2 Extended Edition is IBM's extended version of the OS/2 operating system for personal computers. It includes an IBM-written relational database with a SQL interface. When it was initially introduced, the OS/2 EE ran only as a stand-alone workstation product. It was enhanced to support a database server configuration in 1989, with DOS-based or OS/2-based PCs acting as clients of an OS/2-based database server.

The SAA architecture includes a specification of an IBM standard SQL, and IBM has stated that it will evolve its SQL products toward that standard to provide applications portability. In the current implementations, however, some significant differences between the products remain.

IBM has also announced its intention to provide distributed database access across its SQL-based products and has revealed a four-step blueprint for providing that access. Detailed timetables for distributed access within each product and between products have not been announced.

The major competitive advantage of the IBM products is, of course, the fact that they come from IBM. Each of the products is a solid, basic SQL implementation, and each product is being steadily enhanced over time. In a few cases (such as referential integrity support), IBM has set the pace for SQL innovation, but generally IBM has been the steady standard setter, leaving the independent DBMS vendors to innovate in new areas of DBMS technology.

HEWLETT-PACKARD CORPORATION

Hewlett-Packard is a major vendor of minicomputer systems, and database management has always played an important role in HP's product line. In the 1970s the company pioneered database management on minicomputers with its Image/1000 DBMS, which ran on HP 1000 minicomputers in engineering and technical applications, and its Image/3000 DBMS, which ran on HP 3000 minicomputers in commercial applications. The Image DBMS was based on the network data model.

In the mid-1980s, HP converted its entire minicomputer product line to a 32-bit RISC architecture and offered two new operating systems for the new product line. The first, MPE/XL, provided backward compatibility with the HP 3000 series. The second, HP/UX, was an HP implementation of UNIX and represented HP's commitment to the UNIX bandwagon.

With the help of technology purchased from an outside DBMS software vendor, HP has implemented a new DBMS, called Allbase, under both MPE/XL and HP/UX. HP offers two alternative interfaces to the Allbase database engine. An Image interface provides backward compatibility for existing applications and presents a network data model view of Allbase data. HPSQL provides a relational interface for new applications and offers an embedded SQL and interactive SQL interface to Allbase data. This dual approach to database access is unique, and it represents a significant technical achievement.

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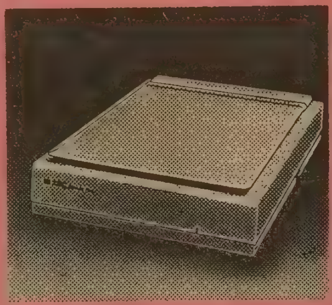

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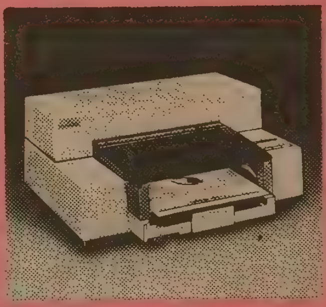

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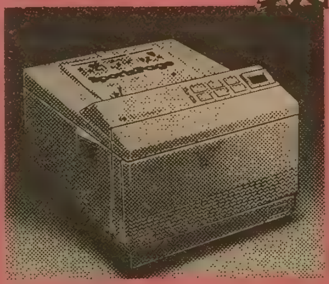

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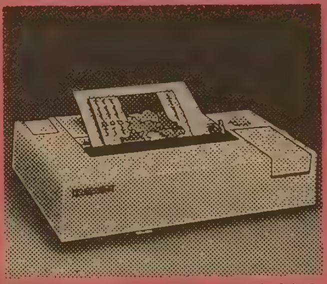

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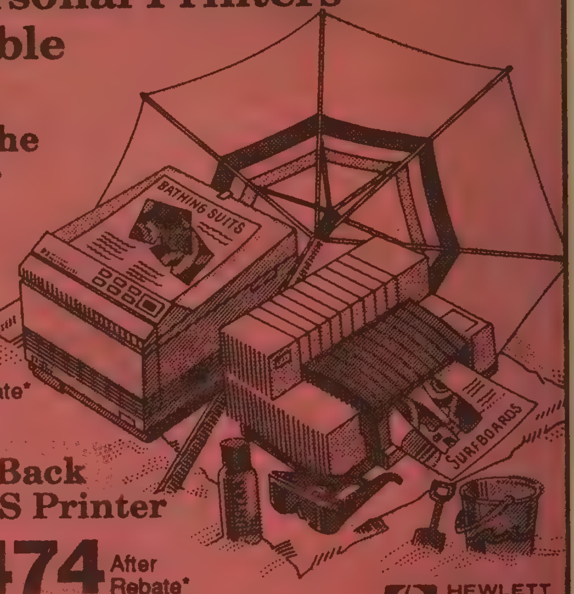

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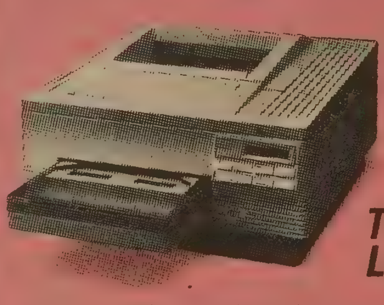

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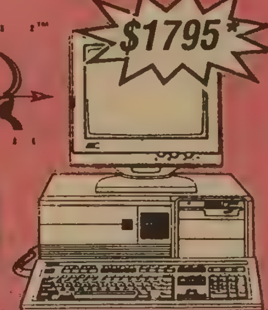

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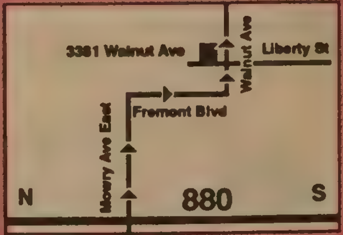

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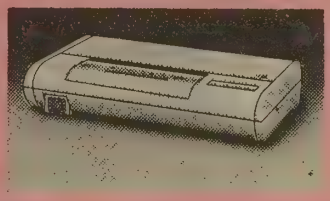

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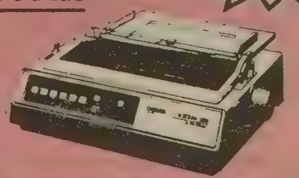

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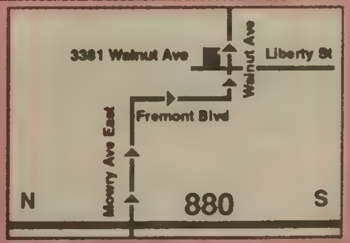

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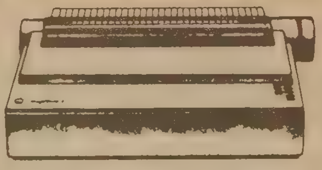

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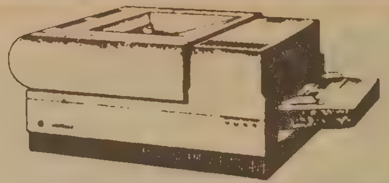

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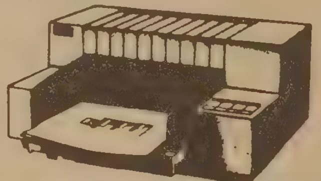

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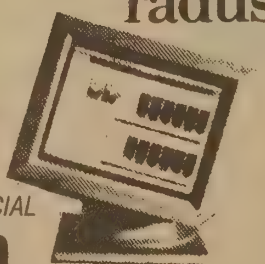

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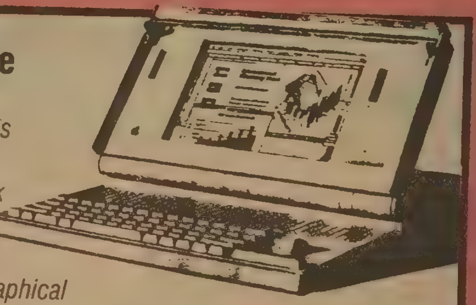

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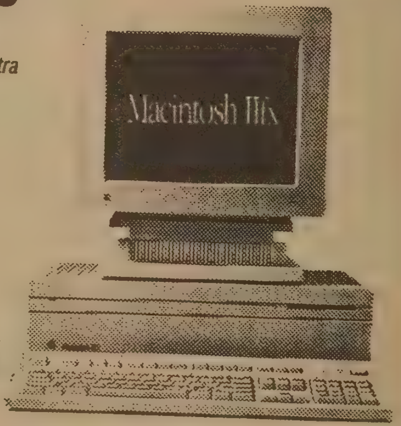

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Testing And Troubleshooting

BY WAYNE A. YACCO

One of the IBM PC's most useful qualities is the large number of third-party vendors attracted to it. Virtually no application plum has been left unplucked by vendors in search of a niche. Unfortunately, there hasn't been enough cooperation in these efforts, so when the fruits of these vendors are tossed together in a computer version of ambrosia, there are often conflicts.

LOCAL AREA NETWORKS

As a result, you will encounter glitches with unfortunate frequency when you configure PC-based LANs. Even machines like the PS/2 and Macintosh, which have intelligent buses, can be perplexing if software, cables and terminators are incorrectly installed. It's just part of the territory with any complex system. This column and the one to follow are about tools that can make the experience less trying.

TESTING TOOLS

These tools can be roughly divided into software and hardware categories. Network monitors, diagnostic software, and remote-control programs can all be used to help diagnose certain types of network problems. Network monitors are particularly useful for fine-tuning performance and eliminating bottlenecks. Often these applications can be used to decide when to add additional servers or when to modify the topology of the network.

Diagnostic software can be useful during configuration. These applications can disclose the contents of I/O memory space (where ROM-based BIOS addresses, shadow RAM, and EMS pages are often mapped), interrupt assignments, port assignments, and DMA assignments. This allows you to compare available resources with those required by the network's hardware, firmware, and software.

Remote-control software can help an administrator or support specialist to solve user problems without physically visiting network nodes. Simple mistakes in the use of applications or system software can be dealt with efficiently using these programs. We will take a closer look at several products in each of these software categories next month.

Copyright © 1990 by Wayne A. Yacco. All rights reserved. An editor, writer, and consultant specializing in microcomputers and their business applications, Wayne Yacco writes articles, columns, and reviews for many trade and business publications. He can be reached at Box 269, Burbank, CA 91503.

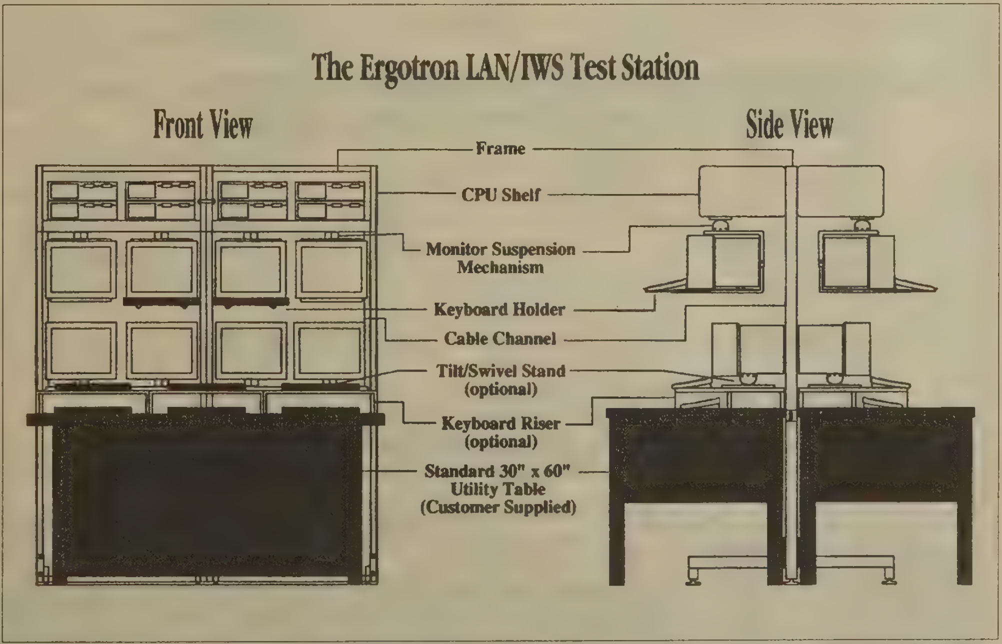
Hardware tools include network analyzers and work centers, and accessories that can be used to isolate and test the connections between nodes. Network analyzers won't be covered here for two reasons. Firstly, they are similar to the software monitors that we'll look at in next month's column. Secondly, and more importantly, they are packaged as a bundle with dedicated hardware and are intended for the professional doing network analysis on a regular basis. The manager of a small network is unlikely to be able to justify dedicating an expensive piece of hardware to this task and is more likely to rely on a software solution that uses a standard PC. That leaves work centers, tools and materials, and that's what I want to talk about now.

TEST CENTERS

When things start going wrong in a complicated environment, it can be very difficult to isolate the cause of the problem. Symptoms may appear only intermittently, or they can be masked by other activity on the network. Whenever possible, it is best to isolate a suspect section of the network and operate it as a mini network on a workbench. This allows you to test connections and to experiment with test traffic more easily. Conducting tests at a central location provides local access to all physical connections. It also allows you to simultaneously see exactly what the users of several nodes see, and to control those nodes.

For those same reasons, using a test station is also the preferred way to go about initially configuring a system. It is much easier to eliminate cabling problems during installation when you know that all of your configuration conflicts were already ironed out on a workbench.

Figure 1 illustrates an extremely compact LAN test station capable of simultaneously testing 16 nodes in the area occupied by two office desks. This station is actually com-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posed of two pairs of two four-node stations, placed side-by-side and back-to-back. Such a station can be used not only for testing isolated portions of a LAN, but for the initial configuration of small LANs. Modules could be added to further increase capacity by units of four.

The test stations in the illustration are offered ready-made by Ergotron and feature keyboard holders and monitor-suspension systems that make it easier to conduct tests. The vertical design permits a large number of nodes to occupy a very small work area. However, if a testing station isn't needed on an ongoing basis, an arrangement could be laid out horizontally on ordinary shelving or desktops. While the arrangement would take up more space and make it more difficult to view all of the nodes without moving, it would be much better than going from node to node in the field. It could also be used for initial configuration of a LAN of any size, given enough space.

A second method for networking at a testing station is to share monitors and keyboards among several nodes. Special switches are available that simultaneously switch a monitor and keyboard. Unfortunately, keyboards lose their connection when switched, and many computers won't reconnect until they are booted again. It isn't practical to switch both keyboard and monitor unless you have a system that maintains this connection. However, switches can be used to put as many as four nodes on a single monitor. You can change the view, by switching, just as fast as you could turn your head to look at multiple monitors. Models are available for both 9-pin and high-density 15-pin monitor connections.

A second device that could prove useful is a BNC switch for making quick changes in thin Ethernet (50 ohm, RG 58 cable) connections without disconnecting or reconnecting cables. For example, an Ethernet switch will let you rapidly alternate several nodes into the same network configuration. It might be used for comparison testing of adapters or other components. Switches could be combined with BNC female splices and BNC T's to quickly change network configurations. BNC connectors are available in many styles, including crimp-on, twist-on, screw-in (to an F connector), and plug-in (to an RCA plug). You can customize a thin Ethernet cable in just a couple of minutes with nothing more than a pair of diagonal cutters and twist-on BNC connectors.

OTHER GOOD RESOURCES

If you have trouble locating switches or any of the parts needed to make connections, all of the material mentioned above can be obtained from Roger Specialist, an inexpensive source of many hard-to-find switches, connectors, and cables of all types.

If you're not quite ready to tackle a configuration, or to try debugging a malfunctioning network, *The Computer Networking Book* by Peter O'Dell may be for you. The new title from Ventana is ideal for new users who need a relatively non-technical introduction into networking terms and concepts. O'Dell makes sure the beginner won't overlook any critical elements in planning for a LAN, and offers a practical approach to assessing needs and evaluating alternatives. ■

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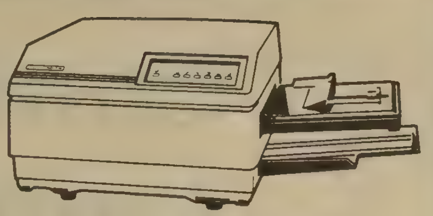

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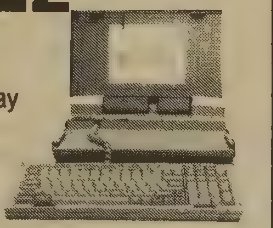

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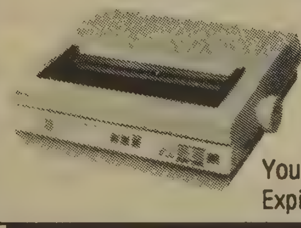

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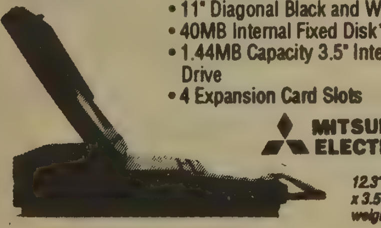

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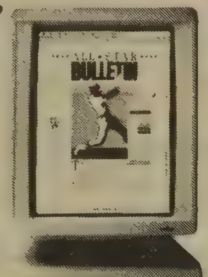

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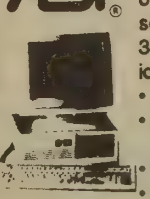

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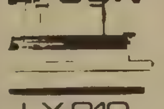

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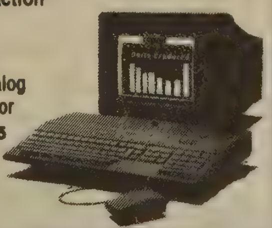

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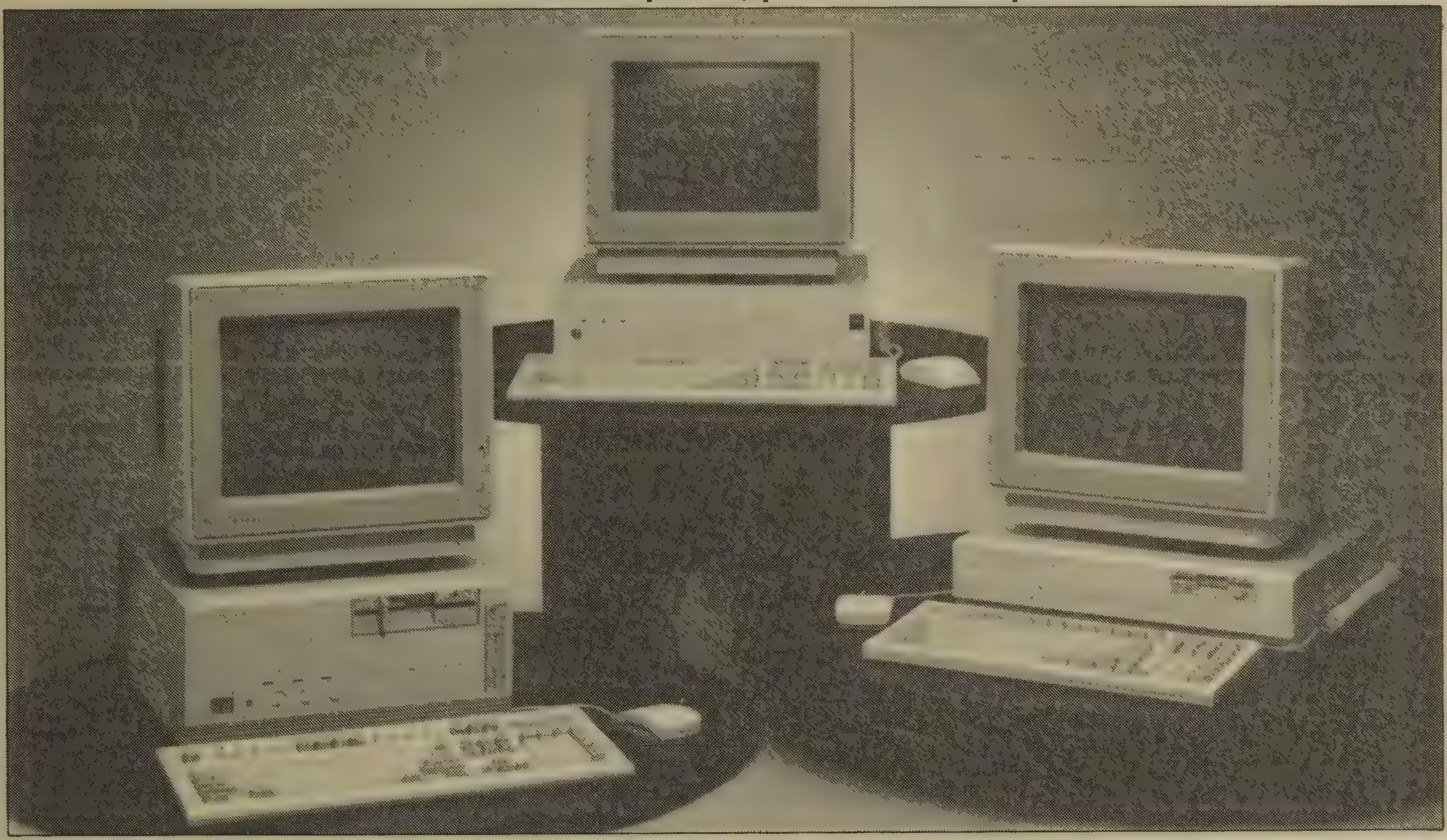

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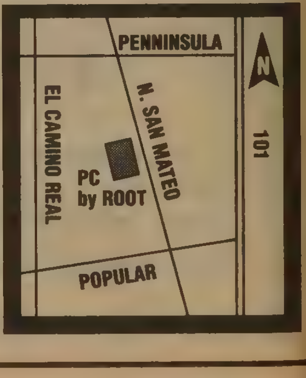

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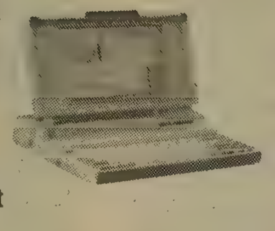

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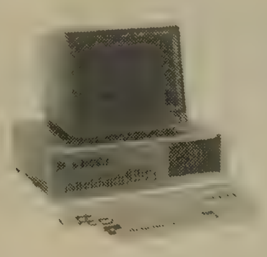

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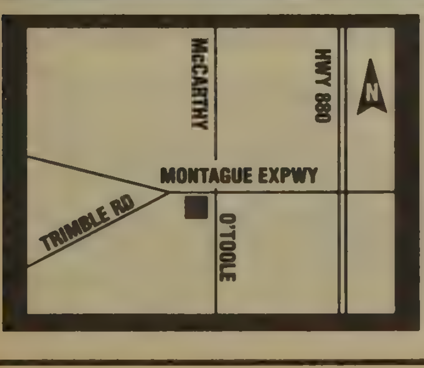

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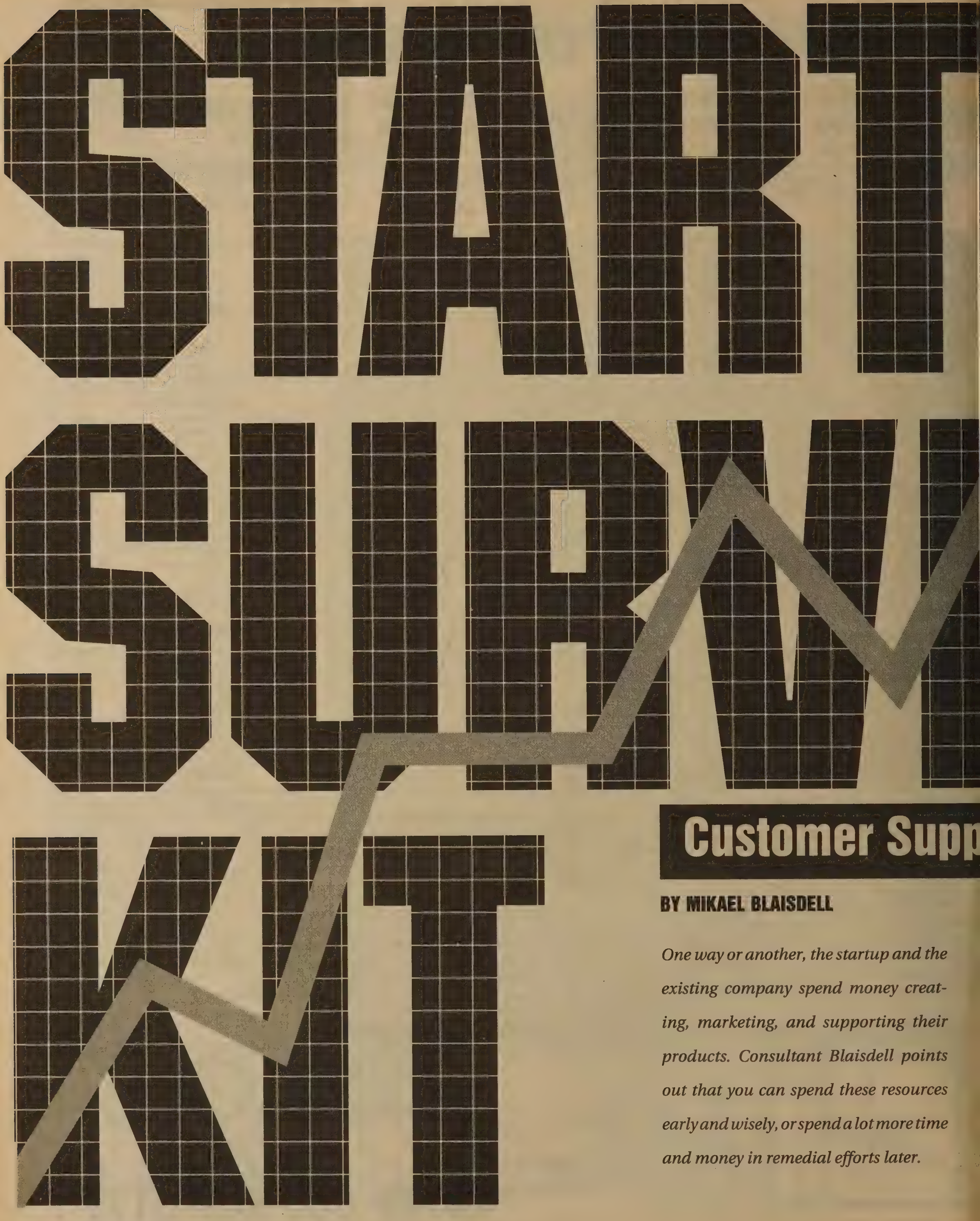

START
SURV
KIT

Customer Supp

BY MIKAEL BLAISDELL

One way or another, the startup and the existing company spend money creating, marketing, and supporting their products. Consultant Blaisdell points out that you can spend these resources early and wisely, or spend a lot more time and money in remedial efforts later.

t: Design Now Or Pay Later

Doctors, it is said, get to bury their mistakes. Software companies are not so fortunate. They may have to live with the consequences of their oversights for years, with abundant opportunities to bitterly regret the long-term effects of short-term thinking.

It doesn't have to be that way. For both new software companies and existing ones considering new products, the question of customer satisfaction should be raised early and often, and in a variety of ways throughout the design, production and release cycles.

Historically, software products (especially for microsystems) have generally begun as the proverbial gleam in someone's eye, followed quickly by the first programming attempts to translate the dream into executable code. Somewhere along the line, usually just before the release date, the documentation gets hurriedly put together along with the marketing materials, and the proud and hopeful creators go off to COMDEX, UNIFORUM, or some other trade show as appropriate.

Encouraged by a pocketful of orders, significant contact notes and hundreds of business cards, the footsore and burnt-out squad returns to the shop to start making disks, drawing up dealer and distributor agreements, and revising the code to include features, enhancements and extended capacities.

Some time thereafter, the tech support phone begins to ring—loudly. And it keeps on ringing.

At first, the programming folks take the calls in stride. Most are from known people on the "alpha-sorta-beta" list, who tend to be technically sophisticated. Engineer talks to engineer, and while they may argue and even violently disagree, they both speak

continued on page 60

Tales From The Shareware Front

BY DAN BAUMBACH

If you've written an interesting and useful program, don't overlook shareware as a marketing approach. Shareware author and current ASP Ombudsman Dan Baumbach offers advice to his would-be colleagues.

I never wanted to be a shareware author. I never even wanted to be a computer programmer.

I was working as a computer consultant and found that many of my clients who were new to computers were tearing their hair out trying to learn to use their machines.

I tried to look through their eyes, and I didn't blame them for tearing their hair out. Computers were very difficult, and most programs seemed like they were designed to be used only by other programmers.

I looked for an easy program to help people navigate around their machines. I got tired of spending money and being disappointed. So I decided to write one myself—I'd written a number of applications in Turbo Pascal, and even sold one to a number of banks. And I'd just started learning C, so I thought this would be a good challenge.

As the program neared completion, I started showing it to a few friends and acquaintances. Many were very encouraging. One went so far as to say, "This is a great program. You should release it as shareware."

SHAREWARE?

I'd never thought of that before. I wasn't a big user of shareware, despite the fact that I used and like Qedit, a popular shareware editor. Most of my experiences were negative—it was too expensive and difficult to navigate around CompuServe looking for good software, and I didn't have the patience to be constantly downloading programs, most of which turned out to be junk. But *publishing* shareware—well, it didn't cost anything, so why not?

I looked at all the shareware programs I had, examining how the manuals were put together, how the disclaimers were written, how the registration forms were designed. I put together my own manual by imitating the best features of the ones I'd looked at.

I first uploaded my program, Director, to CompuServe in July 1988. I had no idea what to expect, but lo and behold, two weeks later a check arrived from a guy in Philadelphia. Two weeks after that there was another from someone in Montana. Pretty neat!

continued on page 54

STARTUP SURVIVAL KIT

Shareware

continued from page 53

The registrations have become more frequent since then, but I'm far from being able to make a living from Director. However, I've met some incredible people I don't think I'd have met otherwise. I think the thing I like best about the shareware world is the contact that I get with end users, and their suggestions and complaints.

One day there was an email message on CompuServe saying that Director was a good program, all right, but I should give it UltraVision capability. UltraVision is a product by Personics that allows your EGA or VGA display to use different fonts and colors, gives you an number of options for extra columns and rows onscreen, and provides better resolution if you've got a multiscanning monitor. Well, I wondered, I've got a plain EGA, and I've already made Director compatible with 43- and 50-line display—why does it have to be UltraVision compatible?

I decided to call this guy's bluff. I answered his message, asking him if he'd register if I made Director UltraVision compatible. His answer: "Yes, I'll register, but I'll do it through my company, *PC Magazine.*"

Two days and a hundred-dollar CompuServe bill later, Director was UltraVision compatible.

SUPPORT AND ENHANCEMENT—A NEVER-ENDING TASK

When you write a program that tries to squeeze as much performance as possible from the hardware, "IBM compatible" takes on a whole new meaning. A computer that's 99.99% IBM compatible might not be compatible enough.

Case in point: in order to read the disk very quickly and display a directory tree, Director had to know some basic formatting information about the disk. There are two ways to get this information: one, the way Microsoft provided and documented, and another using a non-documented DOS function call.

Originally I chose the non-documented way, because it was faster and it worked with every version of DOS I tried, from 2.1 to 3.3. Occasionally "real programmers" would get on my case about using non-documented DOS functions, because you never know whether they'll be supported in future versions of DOS.

When I made Director compatible with large partitions in Compaq DOS 3.31 and DOS 4.0, I changed to using the documented approach, again for speed reasons. This consisted of reading a portion of the disk called the BIOS Parameter Block and getting the formatting information from that. And I felt better using the "legitimate" approach to the problem.

Shortly after releasing this version, I got an order from a hospital in Tennessee for a site license for 200 copies. The PC manager had tried Director on his machine at home and loved it. We agreed on a price, and he set the machinery rolling at his end.

A few days later, I got a frantic phone call from him. Apparently, Director was crashing on all the machines at the hospital. It wasn't even loading up correctly.

As it turned out, all the machines in the hospital were from one well-known compatible vendor. Several very long days and nights later, I discovered that the disks formatted by this Fortune 500 company's version of DOS didn't have BIOS Parameter Blocks.

When I went back to using the non-documented way of getting the disk information, the program ran fine. Well, almost: the computers also didn't report the correct row and column information, so I had to code a fix around that too. No-name clones seem to be more IBM compatible than this particular vendor's machines in this situation.

While writing this article, I got a call from a user who wanted to know if I was thinking of making Director DESQview compatible. I told him many registered users run Director under DESQview every day. True, he admitted, but he pointed out that under DESQview you must run Director in a full-screen window which you can't shrink. However, the caller still liked the program so much he wanted to register three copies anyway.

I'm always ready to add a new feature to Director if it makes the program more marketable and doesn't detract from its performance, so I borrowed my friend's DESQview manual and added a few lines of Assembler from the back of the manual to make Director "DESQview Aware." I tested it on my friend's machine, and everything worked fine. Of course you couldn't see anything in the shrunk window, but if that's what the users wanted, who was I to argue? I could already see the line "Director is DESQview Aware" in my next press release.

Soon, I started getting calls. "Something's wrong with my copy of Director; every time I run it, I get DESQview QEMM errors." "Director runs fine on my machine, but if I try to run it under DESQview, it crashes."

Of course none of these calls came from people around the block. My theory is, the more difficult the problem, the further away the user.

Since the program worked fine under DESQview on all the machines I had access to, and not on the ones that were 1,000 or more miles away, and I wasn't a DESQview user myself, I took out the extra code. Director is now back to its Unaware self, and runs just fine under DESQview using the full screen.

My latest problem also has to do with DESQview. Director has been tested with DOS 4.XX disk partitions up to 150Mb both conventionally and under DESQview, and it works fine. Director also runs fine with large partitions created by Speed Stor and On-Track Disk Manager. However, a loyal user in San Diego put large Speed Stor partitions and DESQview together and crashed Director. Even stranger, earlier versions of Director worked fine on this setup. At least I have the earlier code, so I can see what minute changes may be causing the problem.

This is a constant problem for the small developer. Just when you think you've tried your program on every machine, monitor, and hard drive combination out there, someone comes along with another combination that brings your program to its knees.

The nice thing about it is that many of these people will like your program anyway, and will call you and tell you about the problem. These are the people who turn out to be your best beta testers.

I FIRST UPLOADED MY PROGRAM, DIRECTOR, TO COMPUSERVE IN JULY 1988. I HAD NO IDEA WHAT TO EXPECT, BUT LO AND BEHOLD, TWO WEEKS AFTER THAT THERE WAS A CHECK FROM PHILADELPHIA.

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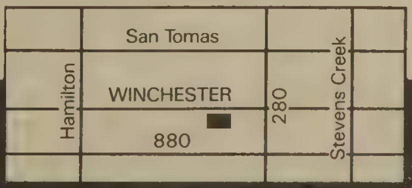

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STARTUP SURVIVAL KIT Shareware

ASSOCIATION OF SHAREWARE PROFESSIONALS

About six months into my career as a shareware author, I joined the Association of Shareware Professionals, mostly because I thought it would be interesting to see what these people had to say. It turned out to be one of the best things I've done.

While I'm not an official spokesman for the all-volunteer ASP, I can explain that it has two main goals.

First, it seeks to elevate the quality of shareware so it's comparable to or better than more traditionally distributed software. Before you can join ASP, your programs must be approved by the membership board. ASP authors must also abide by minimum support requirements and agree not to cripple or inadequately document their unregistered programs.

The second goal is to educate the public about shareware—that shareware is not free, that it's a method of distribution whereby users get to try the program to see if they like it before they pay for it. However, if they like and use it, the must register and pay for it. ASP stresses that buying a program from a shareware disk vendor does not constitute buying the software, which is done by registering with the author. ASP recently began accepting associate memberships from disk vendors, who must clearly state in their catalogs what shareware is and how to register it with the author.

ASP wants the public to have the assurance that buying from an ASP author means getting high quality software with high quality support at a reasonable price. Some users are admittedly wary about buying a product from a tiny company. To address this concern, ASP created the position of the ASP Ombudsman.

Since ASP is an all-volunteer organization, last October I was asked to serve as the ASP Ombudsman. Since then I've received many questions about ASP; many frantic users looking for missing authors (none of whom turned out to be ASP members), and a few complaints. Only recently have I received any complaints against ASP members—I'm still trying to contact one of the two authors, and the other has agreed to leave ASP because he won't provide the level of service it requires.

For me, the best part of ASP has been hanging out on CompuServe with all these great people. Most shareware authors are people like myself who just happened to get into it. Since most of us are spread all over the country, we've had no one to talk to, ask questions, and share information with, and this is a welcome resource. ASP has four forums on CompuServe: IBMJR 8, 9, 10 and 11. IBMJR 8 and 9 are open to the general public; to get there type GO SHAREWARE at any prompt. Also, according to a recent arrangement with CompuServe's management, when you register any ASP program, you can get a free membership to CompuServe with a $15 usage credit.

If you just want to use US Mail, you can get more information about ASP by writing to ASP, PO Box 5786, Bellevue, WA 98006.

GUERRILLA MARKETING

Some people think that shareware requires no marketing—its authors, they assume, just upload their programs to CompuServe and a few BBSes and wait for the checks to start rolling in. Maybe that's worked for some people, but not many.

As with any product, the more people know about it the better. I always carry copies of Director with me, and freely give out copies to any interested parties. I've also done demonstrations at user groups in my area. Some authors even send out press releases to all the major computer publications.

The great part about being a shareware author is that it brings you constant surprises. Not long ago I was awakened at 3 am by a phone call from England; a user wanted to register five copies. Another call was from Norway—the caller wanted to distribute the program in his country. I did some checking around, we came to an agreement, and you can now buy Norwegian versions of Director, with Norwegian documentation, in Norway. Someone else who wants to distribute the software in France.

WHEN YOU WRITE A PROGRAM THAT TRIES TO SQUEEZE AS MUCH PERFORMANCE AS POSSIBLE FROM THE HARDWARE, "IBM COMPATIBLE" TAKES ON A WHOLE NEW MEANING.

THE PATH TO RICHES?

When I spoke at my local user group recently, one of the questions from the audience was whether I'd been able to buy a house in Sausalito from my profits. The answer, of course, is no. I still work out of my two-bedroom apartment in a decidedly non-yuppie part of San Rafael, and I only have a 286 computer. I make most of my living as a consultant and programmer in C and dBASE.

There are, however, quite a few authors supporting themselves quite well with shareware, and they all stress the importance of patience and persistence. Since you're usually not placing ads in national magazines, it will take people longer to learn about your product.

Director's been out for a year and a half, and it's only quite lately that people seem to be hearing about it. Just recently I've started getting a few registrations from Europe and regular registrations from Canada. With European distribution and arrangements I'm making with VARs to distribute Director with their machines, I have hopes of greater profits in the future; maybe by this time next year, I'll be able to afford a parking space in Sausalito.

My advice to the budding shareware author: Don't do it for the money. Do it for the love of programming, the love of designing a nice product that can enrich people's lives. Do it for the love of sharing that product with other users and listening to their feedback.

And, if you're lucky and persistent, you just might make some money. ■

Copyright © 1990 by Dan Baumbach. All rights reserved. Dan Baumbach is president, owner, and employee of the month of Helpware, a shareware and computer consulting business in San Rafael. Most of his living is made by helping people with their computers and programming in C, Clipper and FoxBase Mac. He can be reached at 100 Bayo Vista Way #6, San Rafael, CA 94901, (415)453-9779 or on CompuServe 71320,1277. You can get copies of Director from him for $35 plus 6.25% sales tax, or obtain it as shareware from many disk libraries, BBSes and CompuServe.

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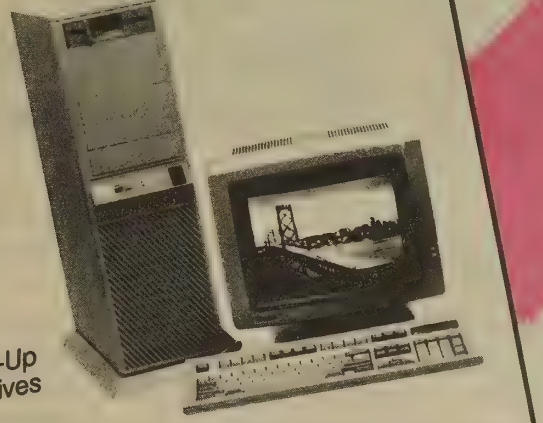

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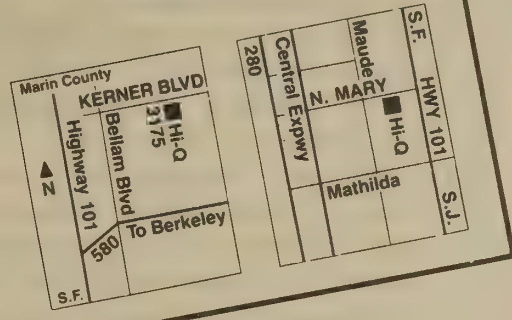

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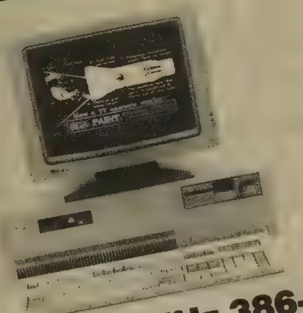

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Landmark = 19.5 SI = 18

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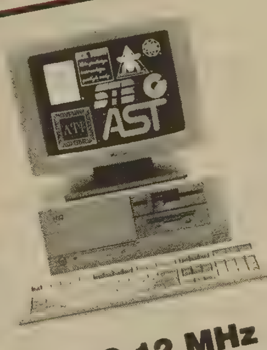

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Landmark = 15.9 SI = 13.4

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STARTUP SURVIVAL KIT

Customer Support

continued from page 53

the same language.

Soon, however, the less-than-technical end users begin to call, and the engineers quickly become unavailable. After all, you *do* want the next release to get done, don't you?

In response to extreme pressure from both engineering and the callers, the company hires its first few technical support people and promptly feeds them to the phone lions. Some of the pressure is relieved, or at least diverted, providing a momentary breathing space for management and programmers.

The stage has been set for the repeating cycles of bug-fix/release and tech support turnover. Late in this process, with some luck, a general revision may be produced that begins to address and correct problems from the design level, and a more stable/supportable product may begin to emerge.

It is not hard to find myriads of perfect examples of this gloomy scenario. It is also not hard to avoid repeating and perpetuating that pattern, or beginning it in the first place. Product quality and customer satisfaction can be designed in from the beginning, rather than being added on.

FIRST STEPS

The process begins in the initial creation phase of the product. Instead of allowing the programmers to immediately begin coding, stop and do a thorough design stage first. In order to design effectively, you must have people with a variety of viewpoints involved, and you must listen to them. Programmer/engineers speak fluent Machine, and are unquestionably important to the project. Just as important, however, are the voices of the end users, and the experts at the job or task that the product is supposed to address. These people usually do not speak Machine, but they do know their jobs and needs very well. And, of course, it is their money that will pay your programmers their salaries and stock options.

The easiest mistake to commit at the beginning of the whole process is to focus on the technology rather than on the needs of the people who will ultimately buy the product. The siren songs of the technoids and marketers can be deafeningly loud, but keep in mind that there are very real rocks you can crash upon. At this point, the presence of the end users is critically important to provide the proper balance. You may have to work at it, but make sure that you listen carefully and keep the focus of the design effort squarely on the users, not on the machine technoglories.

The writers of the documentation group should also be present from Day One, to become very familiar with the language and personalities of the users. The manuals must be written to and for the users, not at them. The writers should also handle the help screens and error messages that will be included within the program. If your documentation team is unwilling or unable to work directly with the users, or balks at the thought of the many rewrites that will result from this approach, you definitely need some new writers. Immediately.

If you are an existing company that already has a technical support department, rename it at once to be the Customer Support department, and assign several of its members to join the design team. Ideally your writers are already members of Customer Support; if not, they should be.

At the same time, make sure your programmers/engineers are taking regular shifts on the hotlines. If that idea causes you or them to wince, you're making two serious mistakes at once. The first is letting your engineers develop "ivory-tower disease"; the second, most likely, is grossly underpaying and underappreciating the hotline staff. Both errors can be incredibly expensive in the long run.

> **SOFTWARE COMPANIES MAY HAVE TO LIVE WITH THE CONSEQUENCES OF THEIR OVERSIGHTS FOR YEARS, WITH ABUNDANT OPPORTUNITIES TO BITTERLY REGRET THE LONG-TERM EFFECTS OF SHORT-TERM THINKING.**

PROTOTYPING

As the prototype versions are created, the testing cycles begin. Not only should you be giving the code a rigorous workout, you should be doing the same for the user interface and the documentation. This is a crucial time. This is where haste will very definitely make later, and expensive, waste.

Bring a number of users in to play with the prototypes, and watch their reactions most carefully. Where are they getting stuck? What seems hard or awkward? What causes them to smile? The engineers need to be present for these exercises, with taped mouths. Bruised egos are vastly easier to heal than unrecognized design flaws.

While the users are testing the prototypes, the documentation should be getting the same treatment, especially the installation procedures. Give each user a copy of the manual and a red pen, with instructions to mark any page containing confusing or ambiguous text with a large X. Note that you will need several sets of users for this process; as each tester begins to acquire some competence with the product, their suitability for testing documentation inevitably declines. The writers should be present in listen-only mode; use tape if necessary.

These testing cycles should be repeated throughout the product life span, with several iterations for each new release version. These should be formal procedures, automatically included in the overall quality assurance effort. However, the informal measures are just as important, and need to be done continuously by the Customer Support group, including regular report and analysis meetings involving engineering and management.

CUSTOMER SUPPORT

Customer Support, often mislabeled "technical support," has an unfortunate history in our industry. It is commonly treated as a Siberian dumping ground for failed engineers and/or shiny new Computer Science grads to see if they're going to be of any practical use to the company. As a result, the company and its products acquire a well-deserved reputation for poor support, which has a significantly negative effect on sales.

The perception of Customer Support as a necessary evil, a cost center grudgingly maintained with the minimum amount of resources, is doubly unfortunate because it overlooks or denies two very important realities.

First, in the customer's eyes, Customer Support *is* the company. Shoddy or grudging support causes the customer to view the company and its products as being of poor quality, and has a well-documented negative effect on repeat sales and word-of-mouth

continued on page 214

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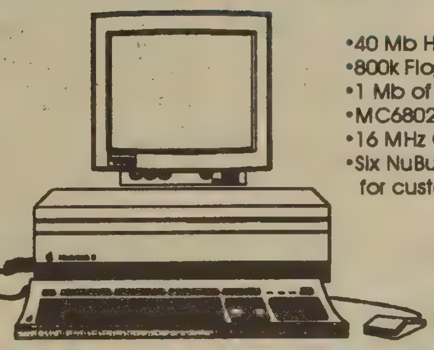

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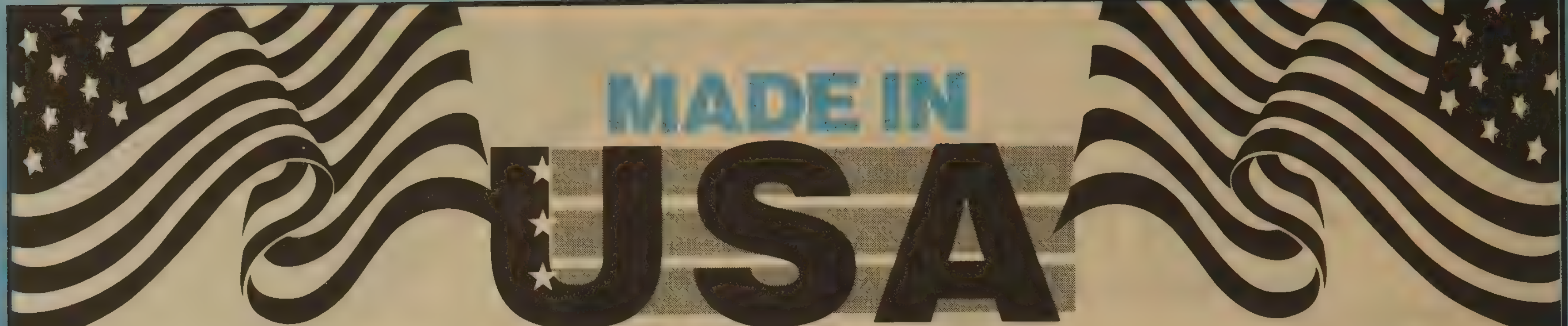

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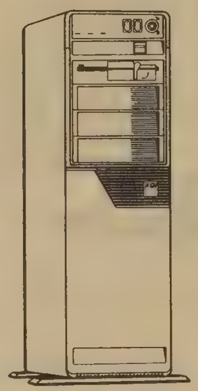

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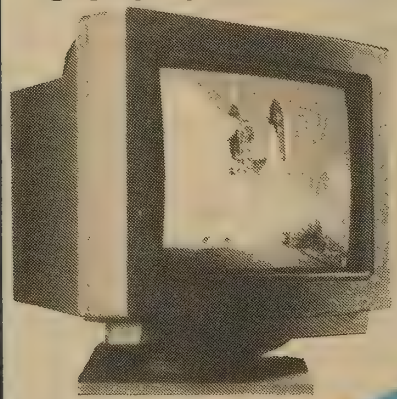
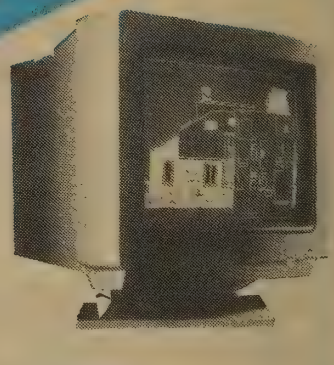

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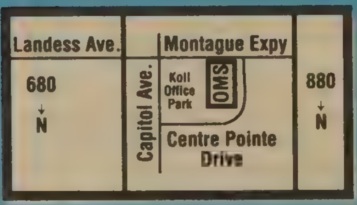

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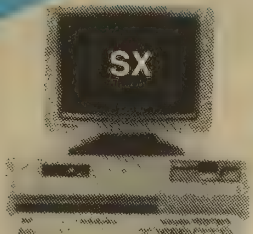

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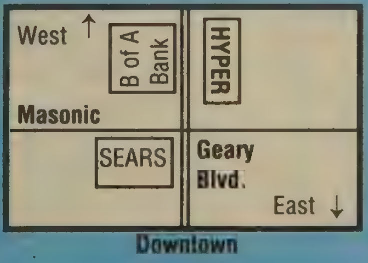


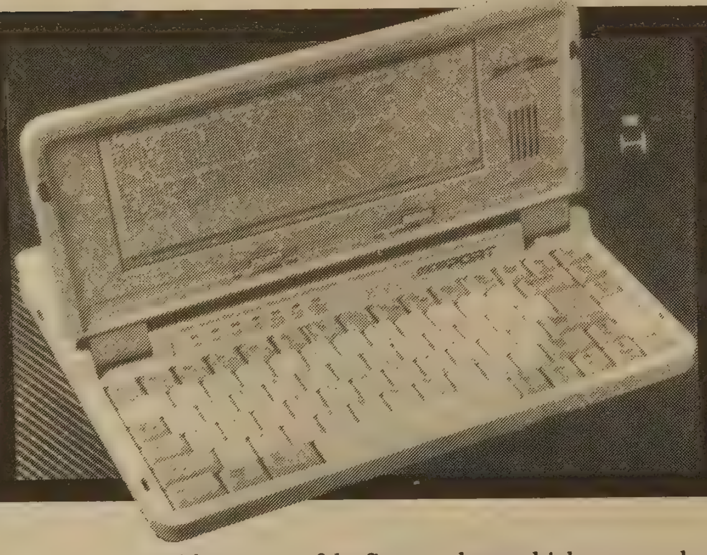
SPECIAL HANDS-ON REPORT:

The Zenith MinisPort

Leading a new generation of ultra-lightweight, powerful portables

BY ED KAHN

As laptops, once themselves a niche market, increase in popularity and miniaturization becomes even more dramatic, a new niche is developing in the portable computing marketplace: the notebook computer. Although therex have been really lightweight machines for years, there was usually some compromise either in capabilities or features. Now, however, a new generation of ultra-lightweight, powerful portables is upon us. New models are being announced almost weekly.



Little larger than a thick stack of paper, the MinisPort weighs under six pounds and offers a full 25 row by 80 column display.

Zenith was one of the first to release a high-powered notebook-size laptop. Their MinisPort is a completely redesigned machine incorporating innovative concepts. When I got this machine, I realized that this was not simply a tiny version of their larger laptops. Rather, Zenith had started from scratch. The result is a machine unlike anything else on the market. Little larger than a thick stack of paper, the MinisPort weighs under six pounds and offers a full 25 row by 80 column display. It is powered by an 80C88 running at 8MHz. It can be switched to the slower 4.77MHz speed if software requires it.

INNOVATION IN MEMORY AND STORAGE

The most innovative aspects of the MinisPort are in the use of memory and storage. The basic machine comes in either one or two megabyte configurations ($1,999 and $2,799). In either model, the memory above the basic 640K can be used as a "silicon disk." This is much like an old fashioned RAM disk, providing nearly instant access time. The difference between this memory and a RAM disk, however, is that an internal battery maintains this memory even when the machine is turned off. In effect, therefore, this memory functions much like an instantaneous hard disk.

The unit I tested had enough memory for me to create a silicon disk of about 1.39 Mb. Through the setup program that comes with the computer, you have the option of configuring this extra memory as either a silicon disk or as EMS expanded memory if you are running software like Lotus 1-2-3 that requires expanded memory.

WORKING WITH THE MINISPORT

When you turn on the machine it boots up to the C drive, which in reality is a ROM drive containing both DOS and Fast Lynx LX, a transfer program by which you can move files between the MinisPort and another IBM compatible computer. This is nearly the same as FastLynx ($149), a standalone program which you can install on any DOS-based computer to transfer files between two compatibles. The standalone version has the advantage of being able to copy files through either the serial or parallel port. Parallel transfers are much faster.

The advantage of the serial transfers, either on the Zenith machine or with the standalone version, is that you can clone the program onto a second computer. This means that if you have the program installed on your portable, you can transfer files to any other compatible computer through the serial cable that comes with the program. Many transfer programs require you to carry a disk in order to install the program on the other computer. With FastLynx, if the program is

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- Supports MS-DOS, OS/2, Unix, Xenix

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386-25 MHz

- Landmark=34.5
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386SX-16 MHz 0 Wait. . . . .
386-20 MHz 0 Wait (w/o CPU). . . . .
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286-12 MHz 0 Wait

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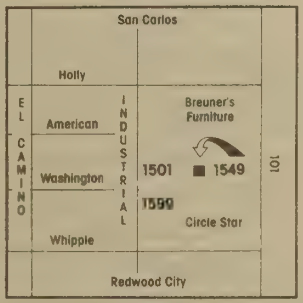

> **Memory above the basic 640K can be used as a "silicon disk." An internal battery maintains this memory even when the machine is turned off. In effect, therefore, this memory functions much like an instantaneous hard disk.**

on your computer you can follow onscreen instructions to transfer the program to a second machine. Once this transfer is accomplished, you can then copy files in a jiffy.

You can create an autoexec file in the silicon disk drive, so that when you turn the system on it will initialize the way you want. The computer boots up from the C drive, then searches the D drive for the autoexec file and then returns you to a C> prompt. In addition to the C and D drives, there is also drive A, a floppy drive. This, too, is a first, as Zenith has opted for a 2" 720K drive. The choice of this mini drive rather than the more conventional 3.5" drive saves both weight and size. These mini disks are a bit pricey, but Zenith does offer a starter kit ($139) which includes 10 disks, a cable to connect the MinisPort to another computer for Fast Lynx LX transfers, and a leatherette slipcase for the computer.

I found Zenith's unique design concept to work well with a number of applications I tested. I installed WordStar in the D drive and set it up to place data files on the A drive. I gave each project I worked on either a different subdirectory or a different disk. This meant that I could organize my material in the same way I do on my desktop machine.

A second application I tested required a modem. I installed the program on a 2" diskette and called it up directly from the A drive. It called on the modem and performed perfectly.

The computer comes with a serial port, but there is also an optional 1200 baud modem ($199) available. If you need a 2400 baud modem, you will have to use a standalone model that connects through the serial port. Although the 2" drive works well and saves space, Zenith has wisely provided a port for externally connecting a second disk drives, which will work as drive B. If, however, you do not have a second floppy drive, the built-in floppy drive will allow you to use it as both drives A and B. In file transfers and disk copying, the computer will prompt you to swap disks.

The 2" disks are convenient. You can buy a second 2" drive ($349) that works from the power supply of the MinisPort. If you prefer, a 720K 3.5" drive is available for $299. This one, too, gets its power directly from the MinisPort. A standard 360K 5.25" drive ($399) requiring its own power supply is available as a third option. Zenith has designed this machine to be extremely versatile.

Resources:

FastLynx ($149)
Rupp Corporation
835 Madison Ave.
New York, NY 10021
(212)517-7775

MinisPort Portable Computer ($1999)
Zenith Data Systems
1000 Milwaukee Ave.
Glenview, IL 60025
(800)553-0331

BATTERIES

The system works on a 10-ounce rechargeable nickel-cadmium battery pack. The AC adapter, included with the machine, lets you run the computer, charge the battery pack, or do both if the battery pack is in the computer while you are operating the machine on AC power. The battery system on the MinisPort is unique. In addition to the rechargeable/removable pack, there are a pair of lithium batteries that maintain memory when you are changing the battery pack. The lithium batteries will maintain the silicon drive for about three days without either the battery pack or AC power. Additional nickel-cadmium battery packs are available for $79. The life of a charge depends upon how you have set up your machine. Under the right conditions, a charge can give up to three hours of computer use.

A setup menu allows you to turn off almost all of the options that can use battery power and therefore reduce the life of a charge. Ports, backlighting, and even the disk drive can be turned off in order to extend the life of a charge. The setup program also allows you to set time and date for the built-in clock and choose a password to limit access to the computer.

KEYBOARD

The keyboard on the MinisPort is not much different in layout from that of many of the full-size laptops. It has an embedded numeric keypad, and an "Fn" key which, when used in combination with the Pad Lock key, makes a convenient block of letters into a numeric key pad. In this mode, these keys are just like a numeric pad in that when the shift key is pressed, the keys double as cursor control keys. For people who work intensively with numbers, this arrangement seems to be a fair tradeoff. But for those of us who are text oriented, it is a cumbersome arrangement at best. I always end up using the number keys across the top and the separate cursor control keys, even when I work with numbers.

The keyboard area has LED indicators to show when the numeric keypad is turned on. Lights also indicate the status of disk drives, scroll, caps, pad lock, and power. I never fully adjusted to this keyboard, either because of the feel or the fact that the keys do not travel the full length to which I am accustomed. It is possible that you may find the keyboard a delight. In any case, this is one of the two drawbacks I find with this unit.

DISPLAY

My other problem is with the LCD. Although it offers a full display and can be backlit, I find the characters too small for my comfort. The whole display measures only a little over 3" x 8." Even though I had trouble with the built-in display, I must praise Zenith for offering the option of connecting to an external monitor. A monitor stand ($49) is available.

If you use this machine for specific applications where size is really an important consideration, I think the tradeoff is worth it. There are also specialized word processors that allow you to increase the size of the text displayed. In any case, the LCD offers a clear crisp display—but a little small for my tired eyes.

Despite its size, this little unit packs a lot of power. I saw that it was possible to use this notebook-size computer for desktop-size tasks with little compromise. ■

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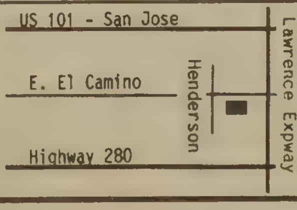
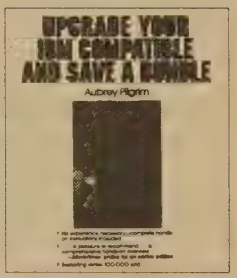


Install A New Motherboard And... Save A Bundle

By Aubrey Pilgrim

If you wish your ancient clone had the performance of those fast new 386 (or even 486) machines, but your budget is telling you not to even think about it, help is on the way. Noted do-it-yourself maven Aubrey Pilgrim returns to the pages of MicroTimes *with this excerpt from his new book,* Upgrade Your IBM Compatible And Save A Bundle. *The book takes even the non-expert user through the process of adding new power and enhancements to old systems.*


UPGRADE YOUR IBM COMPATIBLE AND SAVE A BUNDLE
Aubrey Pilgrim

If you have an old PC or XT, a new motherboard can give you all of the benefits of a new system at a fairly reasonable cost. Just pull out your old motherboard and install a new baby 286 or baby 386. If you have an older standard 286, it's also easy to move up to a 386.

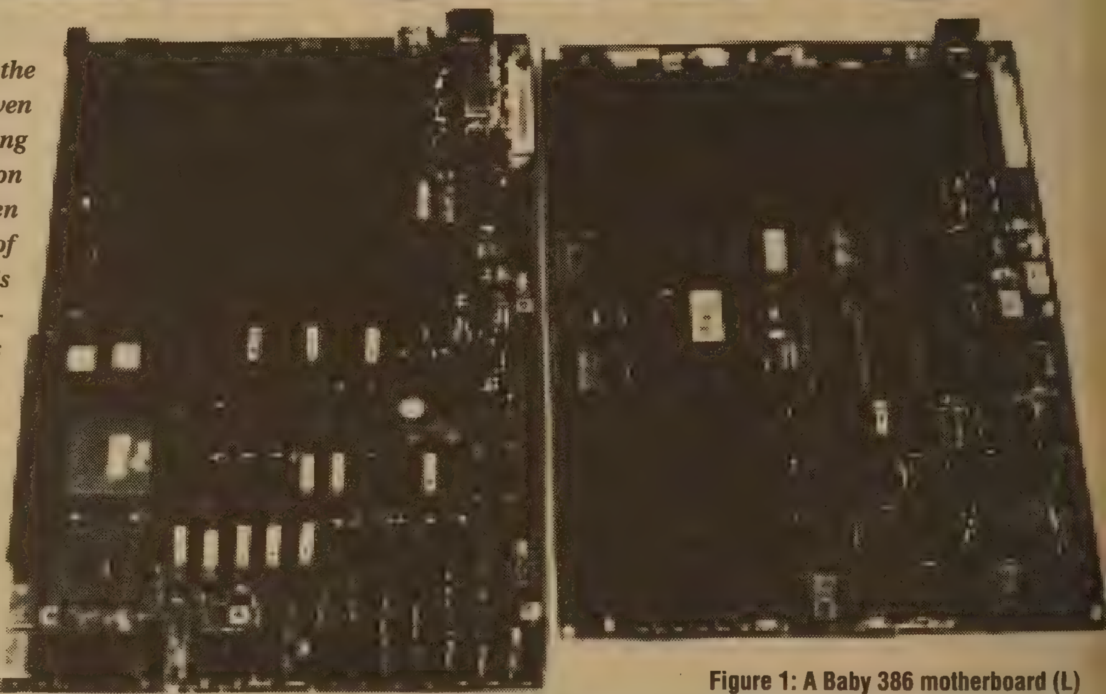


Figure 1: A Baby 386 motherboard (L) and an XT motherboard. The Baby 386 will fit in most old XT cases.

Copyright © 1990 by Aubrey Pilgrim. All rights reserved. Aubrey Pilgrim is the author of the books "Build Your Own IBM Compatible And Save A Bundle," "Build Your Own 80286 IBM Compatible And Save A Bundle," "Build Your Own 80386 IBM Compatible And Save A Bundle," and "Upgrade Your IBM Compatible And Save A Bundle," published by TAB Books. The books are available at larger bookstores or from the author at 15663 Dodrill Drive, Hacienda Heights, CA 91745.

PROTECTING YOUR HARDWARE INVESTMENT

Even if you are moving up from an old PC or XT, you will still be able to use most of your old components, such as the plug-in boards and disk drives. You may even be able to use your old memory chips.

You may not be able to use your old keyboard. Although the PC, XT, and 286 keyboards look exactly alike and have the same connector, the PC and XT keyboards will not work on the 286 or 386 because they have a different scanner frequency. Some of the keyboards have a small switch on the back side that allows them to be switched from one type to the other; some of the newer ones can detect what system they are connected to and switch automatically.

Even if you do have to get a new keyboard, though, it's not going to be one of your major upgrade expenses. I have seen some fairly good ones at swap meets for $30-35. Try the keyboard before you buy it—some keyboards require only a very light touch, and if you're heavy-handed like me you might not be happy with one that's too light.

DECIDING WHAT TO BUY AND WHERE TO BUY IT

One of the first things you'll have to do is decide what you want—or, more precisely, decide what you want at a price you can afford.

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- 101 keyboard
- AT case and 200W p/s

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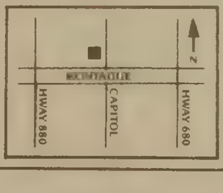

articles and reviews of hardware and software. Not to mention lots of ads from stores that sell by mail. The ads give me a fairly good idea of current prices, which can vary considerably. If you don't live near a large city, mail order might be a good way to purchase some of your parts.

In larger cities, there are usually plenty of computer stores. In the Bay Area and Southern California, there are hundreds, and computer swaps going on every weekend. If I need something, I will go to one of the swap meets and compare the prices at the various booths. I often take a pad along, write the prices down, then go back and make the best deal I can. Sometimes you can haggle with the vendors for a better price, especially if it's near closing time.

UPGRADING A PC OR XT TO AN XT TURBO

By moving up to a turbo XT if you've got a regular PC or XT, you can double or even triple your processing speed at a cost of between $140 and $200.

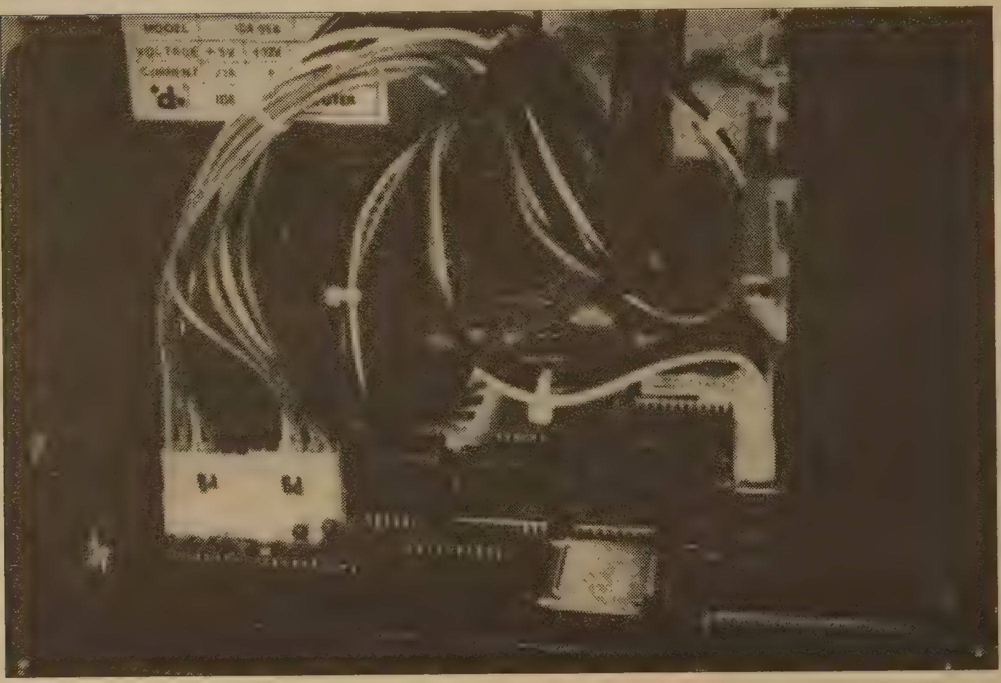

Figure 2: Connecting the power supply to the motherboard. Note the four black wires in the center.

The original PC and XT used the 8088 Central Processing Unit (CPU). This CPU has about 29,000 transistors and operates at 4.77 megahertz (MHz). Computers perform their operations by moving blocks of data in precise blocks of time. The PC and XT can cycle 8-bit blocks of data at 4.77 million times per second. That sounds fast, but it takes eight bits to make a single byte. It also takes eight bits to create a single character of the alphabet. It takes a whole lot more bytes if you are using graphics. It can be painfully slow if you have to run a CAD program or a large spreadsheet.

The turbo XTs have been souped up so that they can operate faster than 4.77 MHz. Most have a "high gear" so that they can be shifted up to 8 MHz, or even 10-12 MHz. Of course, the faster the speed, the more the board will cost.

You might see a turbo XT motherboard advertised for about $65. The ad will probably say "0K memory." This means that it has zero memory, not that the memory works fine. For today's applications, it would be difficult to operate with less than 640K; at the current price of chips, 640K of 150-nanosecond (ns) memory costs about $75. Faster chips—100- and 80-nanoseconds—will cost more.

If you have an original true-blue IBM PC, it will only have five slots, and the case or chassis has five openings on the back panel. The XT, on the other hand, has eight slots and eight openings on the back panel. Since almost all motherboards currently available have eight slots, your old PC case will not accommodate the newer motherboards, and your best bet is to scrap the old case and buy a new one, which should cost about $30. If, for some reason, you're in love with that IBM logo and want to keep the old case, there are a few companies that make special motherboards for the five-slot case—but buying one of those motherboards will cost more than a new case and an eight-slot motherboard put together. Buy the new case, rip the IBM logo off the old case, and tape it to the new one...

If you are upgrading a PC, you should also buy a new power supply. While the XT and later models had 135- to 150-watt power supplies, the original PC had a puny one with only 63 watts. These days a 150-watt power supply costs about $60-75.

Of course, to really improve your machine, you should consider adding (or replacing your old floppy drive with) a new 1.2Mb drive. This would add about $120 to the project's cost, for the drive and a new controller, but it would allow you to read and write to all of your old 360K diskettes while taking advantage of the new 1.2Mb floppies (available at 39¢ a disk from some sources) to store 3 1/3 times more data on each disk.

This might also be a good time to add a 30- or 40-megabyte hard disk to the system. This could cost an additional $350-500, but if you do much computing it's definitely well worth it.

UPGRADING A PC OR XT TO AN 80286

The IBM AT (for Advanced Technology) uses the 80286 CPU. It has 125,000 transistors and is a 16-bit system. The original IBM AT operated at a very conservative speed of 6 MHz, but many of the 286 clones today run at 12, 16, or even 20 MHz.

An 80286 CPU handles data in 16-bit chunks, twice the performance of the 8088. A 286 operating at 10 MHz would be more than four times faster than an XT operating at 4.77 MHz. Because it handles twice as much data per cycle, the 286 will still be twice as fast even if the XT is operating at 10 MHz.

The standard-size AT or 286 is a bit larger than the XT. The XT is 5" high, 19 1/2" wide, and 16 1/2" deep. The AT is 6" high, 21 1/2" wide, and 16 1/2" deep. By combining several chips into single very large scale integrated (VLSI) chips, the clone builders soon developed a "baby" 286 motherboard that was about an inch longer than the XT but still fit in the XT case. The baby 286 and baby 386 motherboards are the same size. Figure 1 shows a baby 386 motherboard alongside an XT motherboard.

One early problem was that several companies had developed 16-bit plug-in boards for the larger size AT that were about one inch wider, or higher, than the 8-bit XT boards. These boards, of course, cannot be used in the smaller XT-size case. Nowadays, though, most new plug-in boards are small enough that size isn't usually a problem.

Many people still prefer the original standard-size 80286, but it has no real advantage over the baby size. Besides, the standard-size 286 is two inches wider than the XT; that might not sound like much, but if your desk is as cluttered as mine, it's a lot. It uses up an extra 33 square inches of desktop real estate.

If you are upgrading an XT to a 286, by all means look for a baby 286 motherboard. The cost of such a motherboard will depend on several options and range from $200 to $800. Most of them have built-in clocks and calendars and serial and parallel ports. Some even have built-in EGA monitor drivers. The speed of the CPU will be a cost

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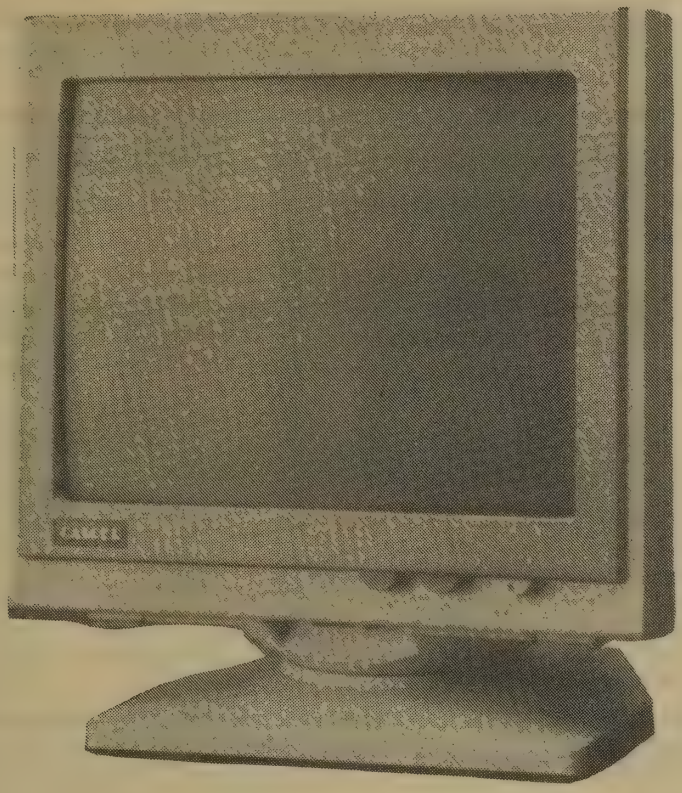

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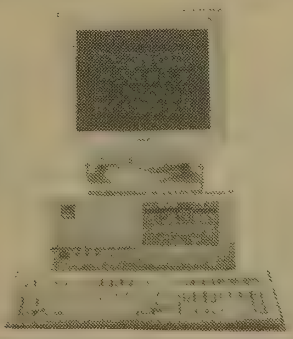

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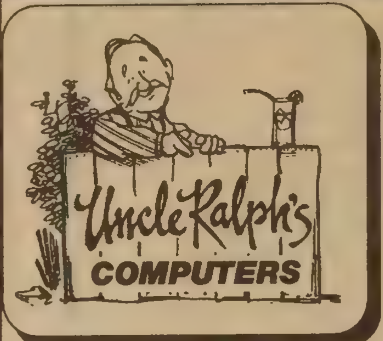

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factor, and so will the amount of memory. If you choose a system that runs at 12 MHz or less, you may be able to use your old memory chips.

You may be able to get by with your old power supply if it is 150 watts. But if you expect to install a couple of hard drives and fill all eight slots with boards, you should probably buy a heavier-duty unit.

UPGRADING A PC OR XT TO AN 80386

The 386 systems use the Intel 80386 CPU. The CPU has 275,000 transistors and can handle data in 32-bit chunks. The standard 80386 motherboard is the same size as the original AT motherboards; again, with the use of VLSI chips, baby 386 motherboards have been developed that are about one inch longer than the XT board but still fit in the XT case.

Several options are available for the baby 386 motherboards. CPU speed, onboard RAM memory, cache memory, built-in serial and parallel ports, EGA monitor drivers, and other options are available at added cost. Of course, the more you can get these goodies already built into the motherboard, the more open slots you'll have. Also, a built-in utility such as an EGA adapter will cost less than buying an EGA board.

You should be able to use all of your old plug-in boards and peripherals. However, you probably won't be able to use your old memory chips unless they are 100ns or faster. You will probably also need to buy a power supply with greater capacity.

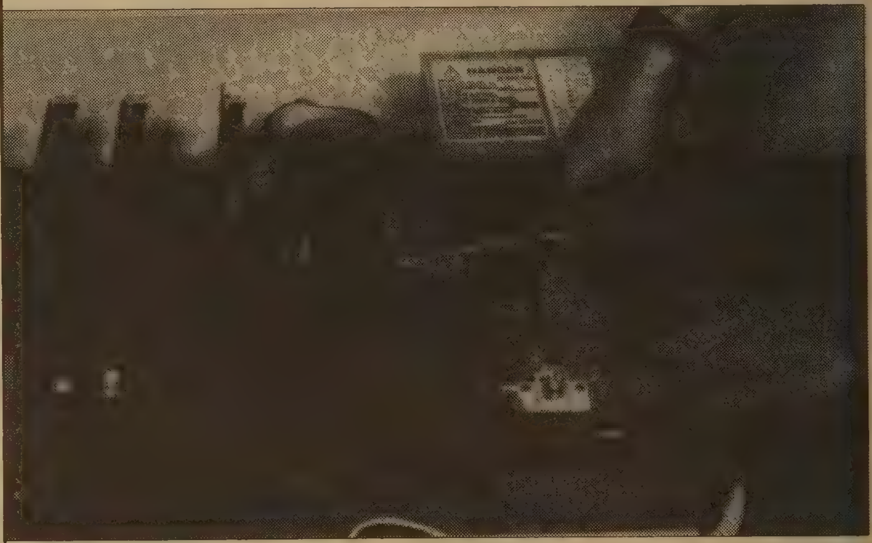


Figure 3: For troubleshooting purposes, it's a good idea to connect everything and try it out before you install it in the case.

The 386 systems are much more complex than the XT or the 286, so the motherboards are more expensive. Depending on the options chosen, the 386 motherboard may cost from $700 to $1200.

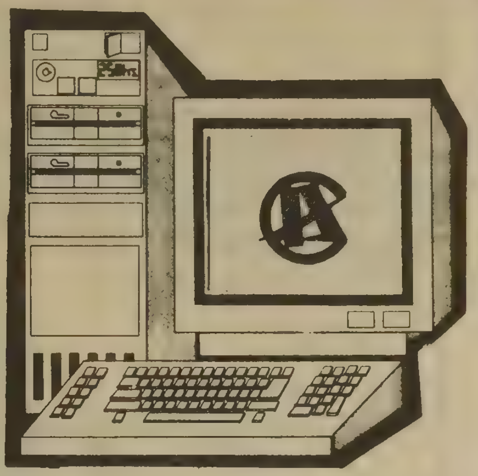
UPGRADING A 286 TO A 386/386SX

If you have a standard-size 286, it will be very easy to move up to the faster and more powerful 386. The motherboards are the same size, and there should be very little trouble using your old plug-in boards. Depending on the speed of the 386 you choose and the speed of your old 286, you may have to buy new memory.

Intel, the sole developer and manufacturer of the 80386 or 386DX, also developed the 386SX. Like the 386DX, this chip uses 32 bits internally, but unlike its big brother it only uses 16-bit lines externally. The 16-bit external operation will cause it to be a bit slower in some applications than the 32-bit 386DX. The chip costs about $150, approximately half of what the 386DX costs. A 386SX motherboard will cost from $350 up to $600.

At the present time, the 386SX operates at 16MHz only, but Intel is expected to release a 20MHz version very soon. A 386SX system will be able to utilize any of the 386 software.

COMPUTER ART



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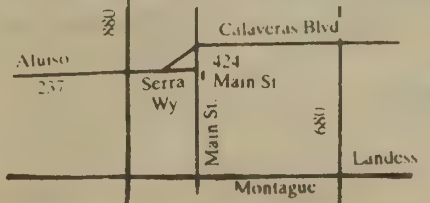

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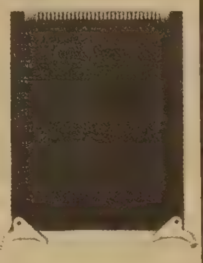

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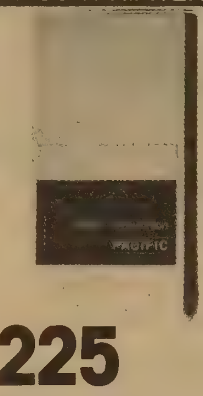

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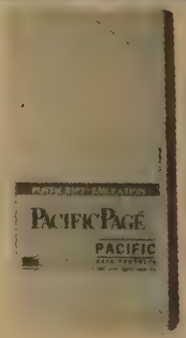

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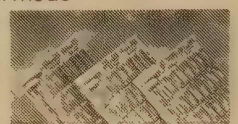

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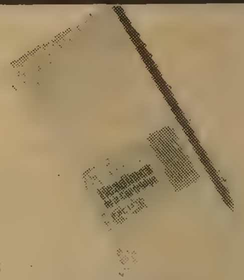

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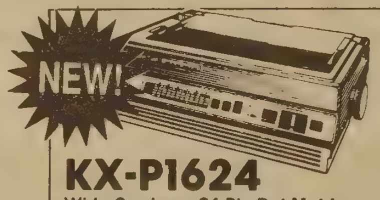

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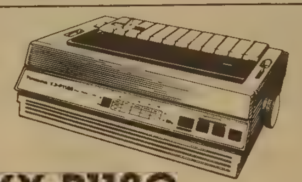

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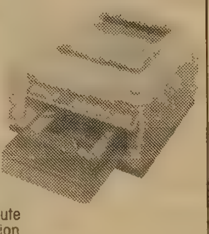

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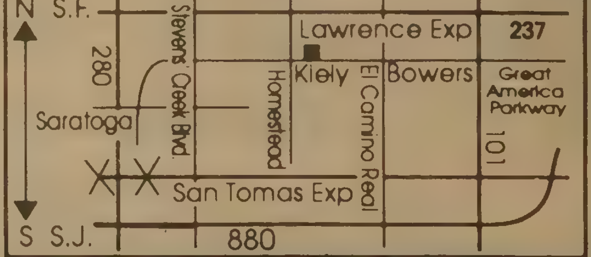

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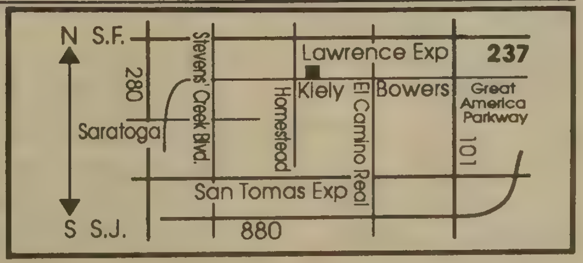

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These computers have a different type of case. You should be able to use most of your present components, but to add a new motherboard you will have to buy a new case, which, as I said, costs about $30.

INSTALLING THE MOTHERBOARD

Now that you have bought a new motherboard, it is easily installed in a few simple steps. Use the following procedures for installing any motherboard.

1. Remove cover.

The first thing to do is remove the cover from your old computer. Unplug the power and remove the screws at each corner on the rear panel and the one at the top center. Slide the cover off.

2. Remove plug-ins.

Make a rough diagram of the location of cables and boards before you disconnect them. You might even take pieces of tape or a marking pen and mark each board and cable with a number. Notice that the ribbon cables have one wire that's a different color—this indicates Pin One, and it's important to pay attention to how it's oriented. On most boards with vertical connections, Pin One will be toward the top. If the connection is horizontal, it's usually toward the front. However, this is not always so; check the boards for a small number or some other indication as to which is Pin One. Note the colored wires on the ribbon cables and record their position on your diagram. If possible, leave the cables from the disk drives connected to the plug-in boards when you remove them.

Note that the connectors from the power supply are connected so that the four black wires are in the center. (See figure 2.) When reconnecting the cables, there's a real possibility that you'll replace the cable connectors upside down or backwards, or on the wrong connector. So be sure your diagram is complete before you disconnect anything.

Remove all the plug-in boards, the keyboard cable, and other wires and cables that are connected to the motherboard. If at all possible, leave the cables connected to the disk controllers. Just pull the boards out and lay them across the power supply. It should not be necessary to remove the disk drives or the power supply.

3. Remove the motherboard.

Depending on the type of computer you have, you may have nine standoffs holding the motherboard off the chassis. If so, there should be nine small nuts on the bottom of the chassis. The standoffs may also be made of plastic, which would be inserted in the holes. If so, they will be held in place by flared portions of the body of the standoff. Use a pair of pliers to press the flares together so the standoff can be removed.

4. Install memory chips.

If you got your motherboard without memory, it might be possible to use the chips from your old motherboard. It depends primarily on how fast your new board operates. For the older 4.77 MHz PCs and XTs, 200ns was plenty fast. You will probably need at least 150ns for an 8 MHz machine, and if it's faster than 12 MHz you should probably get 120ns or faster. Some systems use wait states so you can use slower memory chips. The size and speed of the chips are usually marked on the top, along with the vendor's name and other information. The zero will be left off, so you might see something like 64-15 or 256-12—i.e. 64K at 150ns and 256K at 120ns.

If you are going to use your old memory chips, you will need a small screwdriver or some other tool to pry them out of their sockets. The blank fillers on the back panel, where there are no boards installed, are a very good tool for lifting chips out of their sockets.

The memory chips will be located at the left front quarter section of the motherboard. There will be four banks or rows of chips, with nine chips in each row. If you have 640K, you should have two rows

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of 256K chips, which equals 512K, then two rows of 64K, making 128K for a total of 640K. If you have one megabyte of RAM, each of the four rows will have 256K chips.

You should get some kind of diagram or information with your motherboard that tells you where the 256K and 64K chips should be installed. Be very careful when inserting them so that they are all oriented in the proper direction. The chips should have some kind of notch or dimple that indicates Pin One. The board should have a marking of some kind indicating how the chips should be oriented. Ordinarily, most of the chips on the boards will all be oriented in the same direction. Be careful not to bend the legs, and make sure that all the legs are inserted.

Some 286 and 386 motherboards will have the Single Inline Memory Module (SIMM) chips. This will be an assembly of nine miniature chips that make up a whole bank. Some of the baby 386 boards use a separate plug-in board for memory.

5. Install the new motherboard.

I usually plug all of the components together outside of the case and try them out. If it doesn't work, it's fairly easy to troubleshoot. (See figure 3.) If there are no problems, I then install the board in the case, try it again, and then install the cover if everything's in order.

Most of the new boards use a standoff system that's different from the one used in the old PCs and XTs. Most of the new cases have raised channels on the floor of the chassis. The channels have holes with elongated slots. Plastic standoffs with rounded tops and a thin groove fit into the holes. The standoffs are pressed into holes in the motherboard.

The PS/2 systems can use all of the older IBM compatible software. Unfortunately, several billion dollars' worth of plug-in boards and IBM compatible hardware cannot be used on PS/2 systems.

Place the board so that the standoffs fit into the holes in the raised channels. Move the board to the right so the grooves slide into, and are locked in, the narrow elongated slots. Then use the screw at the back center of the board and one at the center front to lock the board into place.

6. Replace the boards and cables.

You are now ready to start replacing your components. Reconnect the power to the board from the power supply. Make sure that it it oriented so that the four black wires are in the center.

Replace your plug-in boards and any cables that were disconnected. Make sure that they are connected properly with the colored wire going to Pin One. If you made a diagram before you removed them, you shouldn't have any problems.

New EISA Boards

The IBM PS/2 systems use the proprietary Micro Channel Architecture (MCA). This system is more advanced than and has several advantages over the standard AT bus system. MCA systems allow faster data interchange between the peripherals, the bus and memory. MCA can recognize the settings of DIP switches on the plug-in boards. The PS/2 systems can use all of the older IBM compatible software. Unfortunately, several billion dollars' worth of plug-in boards and IBM compatible hardware cannot be used on PS/2 systems.

However, there's some good news. When IBM abandoned the standard AT bus, it was renamed Industry Standard Architecture

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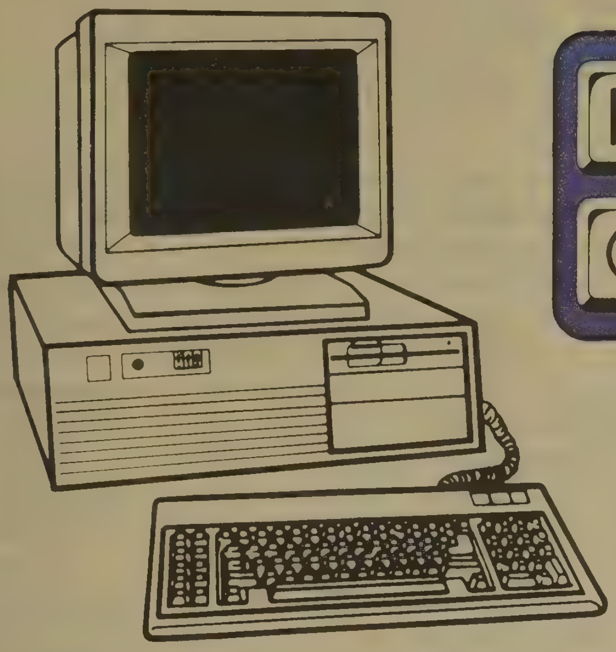

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Parallel Port/Serial Port
Clock/Calendar

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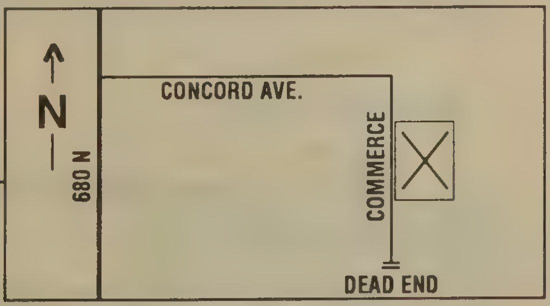

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(ISA). In an instance of rare cooperation, a "gang of nine" IBM-compatible manufacturers got together and devised the Extended Industry Standard Architecture (EISA) bus system. The EISA bus will do everything that MCA will, and in some cases it will do it faster and better. Even better, the new EISA standard is designed so that the older-style XT and AT boards can be used.

EISA boards have unique connectors that are about twice as deep as the standard type. They also have twice as many pins on the edge connectors, arranged in two rows, one above the other. When the EISA boards are inserted, both rows of pins make contact with the connectors on the board. The connectors have cross keys. The EISA plug-in boards have matching slots so they can be inserted to the full depth, but the older standard boards can only be inserted to the depth of the cross keys. Their edge connectors only make contact with the top row of pins on the board connectors.

At the time of this writing, only a few manufacturers are offering EISA motherboards and plug-in boards, but by the time you read this several 386- and 486-based EISA boards should be on the market. At the moment, nobody seems to have a 286-based EISA motherboard.

486 Motherboards

At the 1989 fall COMDEX, there were only a few 486 motherboards, but they should be relatively plentiful by now. However, these boards are still very expensive—the 486 chip alone costs over $1,000. A 486 motherboard will cost you about $4,000 currently, but as more vendors enter the market the prices should start coming down.

Depending on memory, hard disks, and other options, a 486 system will cost $10,000 and up. At this point, most people don't need all the power and speed of the fabulous 486. But it's probably a lot like driving a Maserati—you might not *need* all that speed and power, but it feels fantastic. ■

SOURCES FOR 486 MOTHERBOARDS:

These are a few of the companies offering the 486 motherboard.

AMI, 1346 Oakbrook Dr., Suite 120, Norcross, GA 30340 (404)263-8181.

Micronics, 935 Benecia Ave., Sunnyvale, CA 94086 (800)234-4386.

Wave Mate, 2341 205th St. #110, Torrance, CA 90501 (213)533-5940.

Fountain Technologies, 12K World's Fair Dr., Somerset, NJ 08873 (201)563-4800.

DCM Data Products, 610 Tandy Center, Fort Worth, TX 76102 (817)870-2202

ICC, 8 East Lawn Drive., Holmdel, NJ 07733 (201)946-3207

Fujikama, 14145 Proctor Ave. #3, City of Industry, CA 91746 (818)330-9733

Soyo USA, 148 8th Ave. #H, City of Industry, CA 91746 (818)330-1712

Caliber Computer, 1635 McCandless Dr., Milpitas, CA 95035 (408)942-1220.

Artek Computer Systems, 750 Montague Expressway #203, San Jose, CA 95131 (408)433-9208.

AOX Incorporated, 486 Totten Pond Rd., Waltham, MA 02154 (617)890-4402

Interphase Corp., 2925 Merrell Rd., Dallas, TX 75229 (214)350-9000

CUI, 1680 Civic Center Dr. #101, Santa Clara, CA 95050 (408)241-9170

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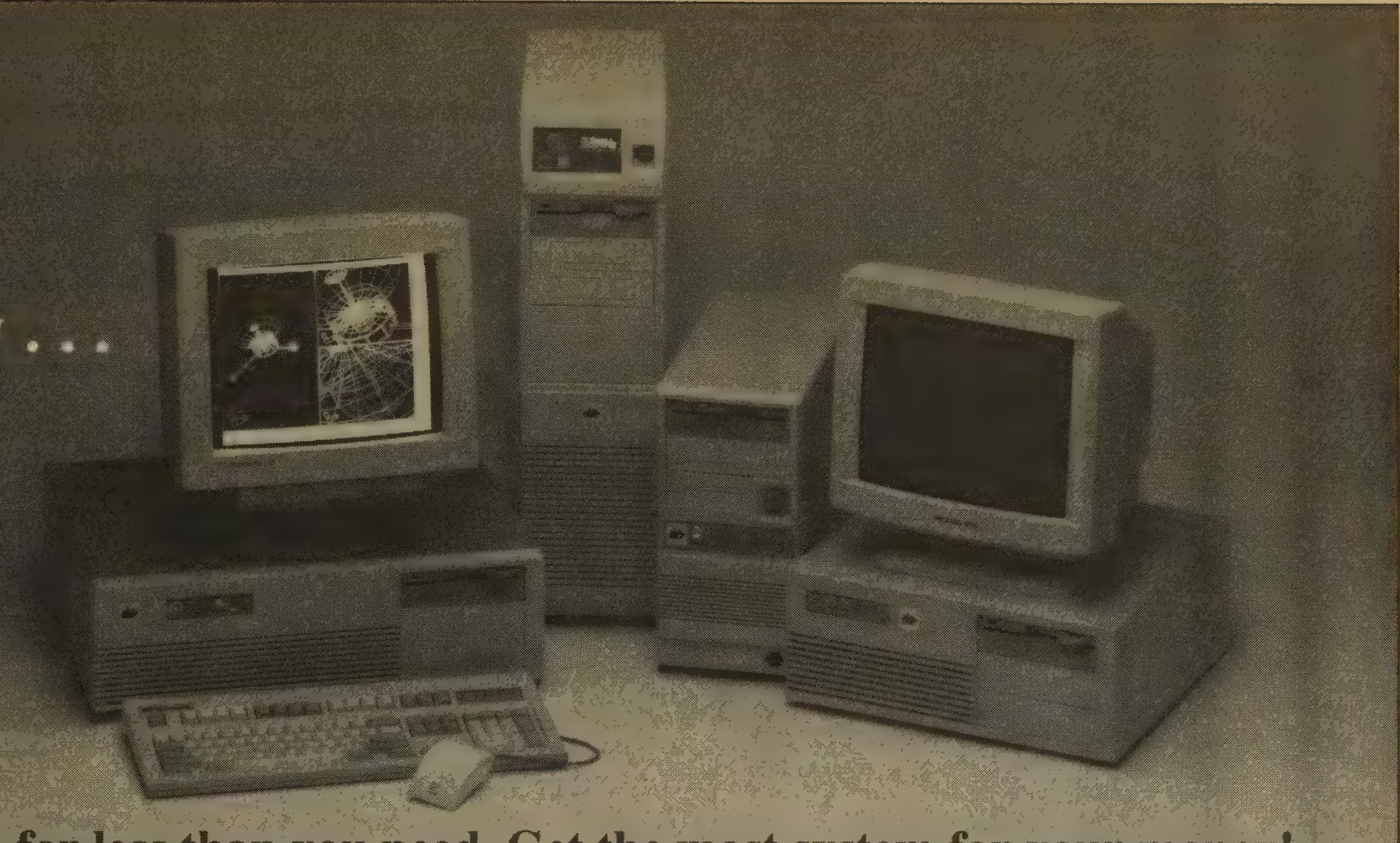

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- ☐ 1024x768 Multisync Monitor
- ☐ 101 Keyboard
- ☐ 220W Power Supply

With 64K Cache
$3,395.00

$2,895.00

BLK 386 20 MHz

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- ☐ 2 MB of RAM
- ☐ 2 Serial, 1 Parallel, and 1 Game Port
- ☐ 5.25" 1.2 MB Floppy Drive
- ☐ 65 MB, 28 ms RLL Hard Drive
- ☐ Dual HD/FD 1:1 RLL Controller
- ☐ VGA Card 16-Bit
- ☐ 14" VGA Monitor
- ☐ 101 Keyboard
- ☐ 220W Power Supply

$2,195.00

BLK 286 12 MHz

- ☐ 80286-12 MHz CPU
- ☐ 1 MB of RAM
- ☐ 2 Serial, 1 Parallel, and 1 Game Port
- ☐ 5.25" 1.2 MB Floppy Drive
- ☐ 40 MB, 28 ms Hard Drive
- ☐ Dual HD/FD 1:1 Controller
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PC WORLD

". . . its price/performance ratio easily justifies PC World's Best Buy recommendation." — PC World, August 1988

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- 1MB 80nS RAM. Expandable to 8MB on the motherboard.
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- Socket for 80387 math co-processor. Latest AMI BIOS. 8 slot std. bus.
- 101 enhanced style keyboard. 3 different manufacturers to select from.
- *Don't settle for less! Get the best for your $Dollar.*

ZTS-386's Options and Features:

ZTS-386's are based on an enhanced chipset by "Chips & Technology" which is currently dominating the PC industry.

- BIOS and video ROM shadowing speeds up the video & BIOS routines about 15%, tested with "PC Journal" program.
- Zero wait state and memory interleaving, separately set & controlled by AMI BIOS, speeds computing up to 30%, Norton test.
- Programmable BUS and DMA speed! You can easily set the BUS and the DMA speed from 8 to 12 MHz. That prevents conflict at high processing speed and guarantees safe future upgradability!

Also Applies to the ZTS 386 SX

TIPS FROM Z.T.S.

Many 386's run only Microsoft programs under latest Windows-386. ZTS-386 was found as one of the very few computers that proves total compatibility by running other programs under Windows as well (as in Compaq & IBM PS/2). For example using Dbase III under Windows-386!

ZTS-386sx

$1299

Landmark = 20.6 MHz
16 MHz 386sx system

Uses "NEAT" chipset. See details on C&T

- 1 MB RAM, expands to 8MB on board.
- 1.2 MB floppy drive TEAC.
- 42 MB hard disk with 1:1 interleave. (IDE, by Western Digital)
- 16-bit controller for 2 fp & 2 HD
- Mono-graphics card and monitor.
- Socket for Intel Co-processor 80387sx.
- Tactile feel keyboard, 101 key-style KB

The ZTS-386sx system is designed with the future in mind. It takes advantage of the NEAT chipset from Chips & Technology, which offers you the full capability of the 386 with it's superior features. It's a com-plete 386 system with 16-bit design. It runs all of the Multi-tasking and Multi-user software.

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Landmark speed 117 MHz MIPS 11.9

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Why ZTS-486 outperforms many others

It is designed to be a true 486 computer and uses the full power of the 486 CPU. It uses a real 486 Bios by Phoenix or AMI. Many manufacturers rush to catch up with today's market, so they just imbedded the 486 CPU to an already existant 386 motherboard with 386 Bios.

- *Based on the new improved Intel CPU 80486-25MHz.*
- *Built-in cache and Math Co-processor. Socket for Weitek.*
- *Video RAM and BIOS Shadowing, Switchable On/Off.*
- *CPU Cache design can be enabled or disabled.*
- *Latest Phoenix or AMI 486 BIOS, supports all 386 software.*

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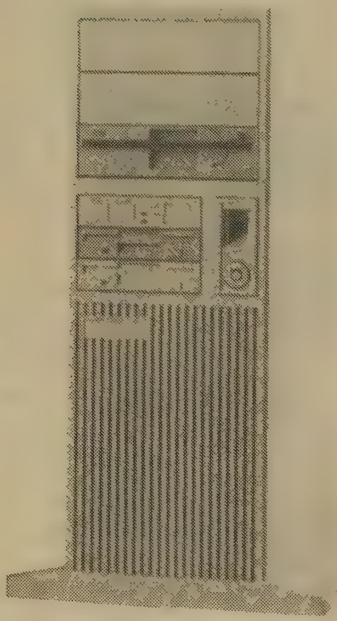

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- *Full size system board. Uses TTL discreet components.*

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- *Omni style keyboard. 102 or 101 Keys. 2S/2P.*

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A Good System Begins At Home

Mom Meets UNIX

BY BENNETT FALK

UNIX

“Passwords are like underwear,” she said, “Both should be changed often.”

“Who are you and what are you talking about?”

“I’m your mother, and I’m talking about passwords.” She stepped into the room with purse, hat, and gloves, looking like Queen Elizabeth. She closed the door without looking back. “Have you changed your password this month?”

“No, I haven’t changed my password this month. You don’t look anything like my mother.”

“Well, I am your mother and you should change your password right away. This very minute, do you hear?” She stepped further into the room and gestured toward my workstation. “Just sit yourself down at that terminal, type ‘passwd’, and press RETURN. You’ll have to enter your current password first and then the new password. You’ll have to confirm the new password by entering it a second time...”

“I know how to change my password.”

“...and whatever you do, don’t forget the new password. It’s stored in an encrypted form and not even the system administrator can find out what it is.”

“Even if you are my mother, why are you on my case about this password thing?”

She sat on the edge of the bed. “Because passwords are important,” she said. “Every UNIX login account should have a password. They ensure that only authorized people use the account, and they help prevent unauthorized use of the system itself. I’m not going to be the laughingstock of this town just because some bonehead son of mine had a password anyone could guess and left a computer system vulnerable to who knows what sort of hooligan.”

“But I like my old password.”

She put the purse aside and looked at her hands folded on her lap. “Well, that’s part of the problem, isn’t it? You don’t understand the first thing about serious password guessing, do you?

“We aren’t talking about an actual person sitting at a keyboard meditating earnestly about what your precious password might be.” She looked up at me. “We’re talking about programs that will make hundreds or even thousands of attempts to crack anyone’s password using enormous lists of words, like the dictionary used by the UNIX ‘spell’ program.

“Now, you get right to work and pick out a new password, one that’s longer than six characters and isn’t in the spelling dictionary. And just for good measure, make sure it has at least one number or symbol in it.”

I sat down reluctantly and started changing my password. “Are you sure you’ve got the right apartment? You’re not at all like my mother, and I’ve got some work here I really have to finish.”

“Oh, don’t worry about me,” she said, smoothing her dress. “You won’t even know I’m here. Just be absolutely sure you logout when you’re finished. You wouldn’t want to waste all the effort you put into making up a good password.

“People are so sloppy about logging out,” she sighed. “They misspell the word ‘logout’ or the screensaver blacks out the screen and they forget to logout at all and the next thing you know somebody else is sitting at the terminal with complete access to an account that is not their own.”

“You know, this kind of thing never happened to me when I used a personal computer.” I twisted around in the chair to face her. “Just how did you get in here, anyway?”

“Never mind how I got here.” She picked up the purse and fidgeted with the clasp, refusing to make eye contact. “Oh, you modern children are perfectly dreadful. You think that everything works like a personal computer: you can do whatever you want because it won’t affect anybody else, and if something happens to go wrong, well, la de da, you just reboot.”

She took a deep breath and looked directly at me again.

“Let me tell you, young man, the things you do have consequences. And there are some things you can’t just wipe away with a reboot. Life is not like a personal computer, and I will not have any of my children growing up

> **“If you stuff everything in one directory, you won’t be able to tell the difference between things you want to keep and things that should be deleted, and everyone will go around saying that my son is a disk hog. You should learn how to use subdirectories so you can manage your files efficiently.”**

Copyright © 1990 by Bennett Falk. All rights reserved. Bennett Falk lives in the Bay Area, writes when he can, and hopes for the best. He works for Sybase, but the opinions and attitudes expressed here are his own.

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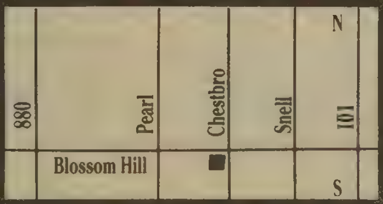

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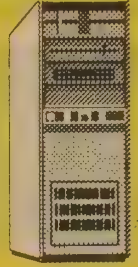

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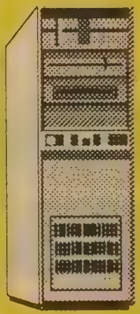

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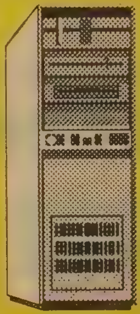

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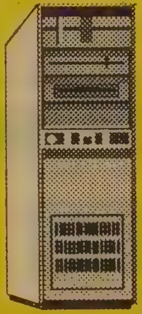

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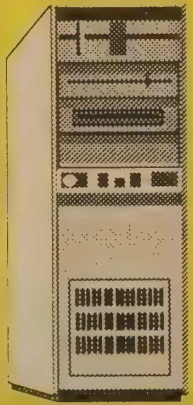

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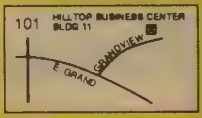

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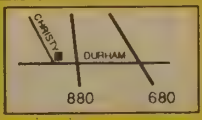

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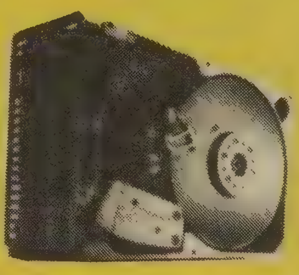

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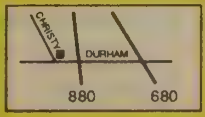

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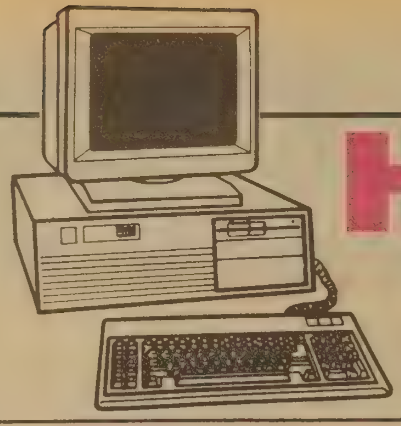

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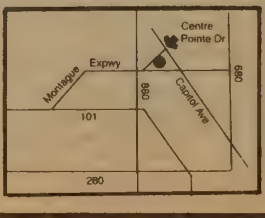

improperly socialized."

"Never go nosing around in other people's files and directories, don't forget to clean up after yourself, and try very hard to have a clue about how resource intensive the commands that you execute are."

"I'm not improperly socialized!"

"So you say, Mr. Smarty-Pants-Intellectual-Earthquake-Survivor, but have you emptied out your 'mbox' file lately?"

"Excuse me?"

"Mbox file, mbox file. You do read your mail, don't you?"

"Of course I read my mail."

"Thank goodness for small favors," she muttered and threw a quick glance at the ceiling. "Since you read your mail, you must have a plan for controlling the growth of your mbox file. Neither UNIX nor I will do it for you, you know. If you get mail and read it with the mail program and do nothing to delete the message, UNIX will happily move the message from your system mailbox to an mbox file in your home directory."

"So?"

"So, unless you take some action, 'mbox' will simply grow and grow until the disk is full, everyone is inconvenienced, and your poor mother is mortified once more."

"Is this stuff in the documentation somewhere? Would you mind just going away and let me read about all this in the manual?"

"Ah, there it is. I knew it," she stood up and extended her arms in exasperation. "Don't listen to your mother, no, what would she know? Read the manuals instead."

She began to pace back and forth on the rug at the end of the bed.

"All that the wretched manual will tell you, young man, is that you can review the messages in mbox with the command 'mail -f mbox'. You can go through the mbox file and delete unwanted messages that way if you want. But the simplest thing is to delete unwanted mail immediately after you've read it, and that's just a piece of common sense and you won't find it in any manual."

"Let me tell you, young man, the things you do have consequences. And there are some things you can't just wipe away with a reboot. Life is not like a personal computer."

She continued to pace to and fro. I twisted in the chair to face her. "Let's say, just for the sake of argument, that you really are my mother. What are you doing up this late?"

"It's never too late for concerned parents to try to instill some sense of values in their children."

She stopped pacing and stared at me fixedly. "You do remember to go to the printer regularly to pick up your output?"

"Yes, I pick up my output."

"Very good, there's nothing worse than unpicked-up output." She walked over and leaned on the back of my chair, peering at the workstation screen. "Let's see your home directory. Is it all nice and tidy?"

"Now wait a minute. None of this is any business of yours."

"It most certainly is my business," she said, backing away and raising her voice. "If you stuff everything in one directory, you'll never be able to find anything except by accident. You won't be able to tell the difference between things you want to keep and things that should be deleted, and everyone will go around saying that my son is a disk hog. You should learn how to use subdirectories so you can manage your files efficiently."

I stood up and turned to face her. "I already know how to use subdirectories."

"Well, that's very nice," she said, looking out the window into the dark. "And I'm sure you pay close attention to the amount of disk space you take up and regularly purge unwanted files. You don't talk to strangers, do you, dear?"

"If I didn't talk to strangers we wouldn't be having this conversation."

The corners of her mouth puckered. "I will overlook your impertinence for the time being. You know very well what I mean by 'talk to strangers'. When you sit at that terminal you can interrupt other users with the 'talk' or 'write' commands, and that can be a very rude thing to do unless you're quite sure the person you're sending the message to is prepared for that sort of thing."

"Well, anyone that doesn't want to receive messages like that can always issue the 'mesg n' command to stop that sort of thing."

"My, but you're a very bright boy. We can only hope you're as considerate of other people as you are smart."

"Will you please stop this? I don't need to be bludgeoned with computer etiquette."

"Oh, yes you do," she sputtered as she started walking toward me. I started backing up. She wagged an index finger in the air between us for emphasis. "It's much, much better to learn these things from your mother than to have some awful authoritarian operating system where everything not commanded is forbidden."

"Okay, okay. Are you anywhere near finished?" I had backed all the way to the door of my apartment. I grabbed the doorknob behind my back and twisted it gently.

"Well, let's see: never go nosing around in other people's files and directories, don't forget to clean up after yourself, and try very hard to have a clue about how resource intensive the commands that you execute are." She had edged close enough that I could open the door with one hand and escort her out the door and into the hall with the other.

"Oh, and recursion," I heard her say through the crack in the closing door. "Be careful to avoid recursion." ■

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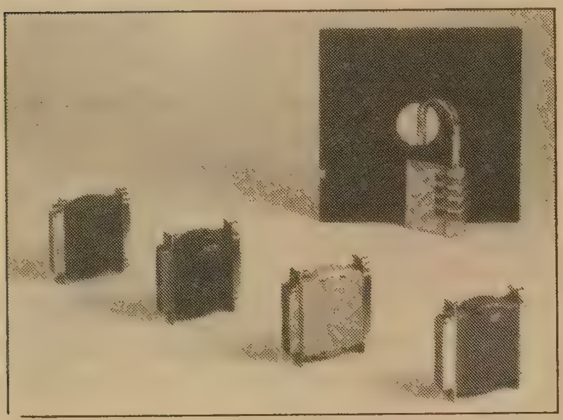
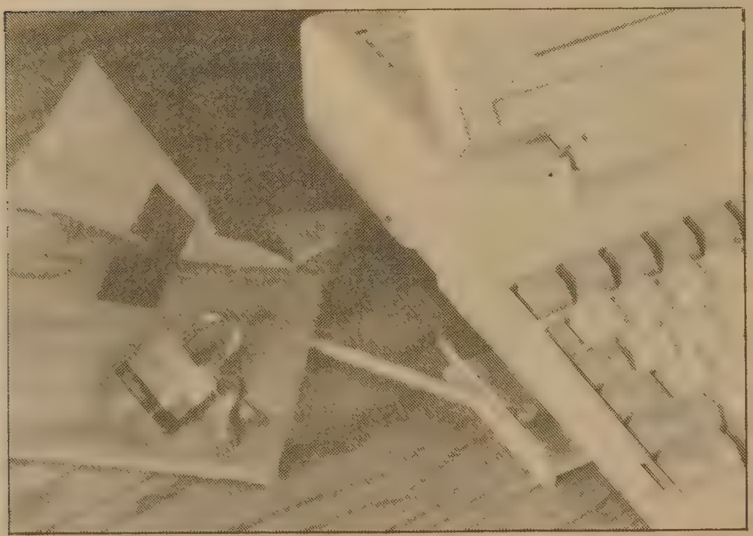


Since 1983, the French company MICROPHAR has been manufacturing and marketing software protection keys. These plug-in devices containing sophisticated random number codes that give only licensed users access to purchased programs can be updated through a diskette or modem without a special adaptor or software interface. The system has been extended with the announcement of two new keys: one for Macintosh equipment, and another microprocessor key for computer equipment with an RS232 serial port. The keys are marketed in the US by ProTech Marketing, Inc. Contact: ProTech Marketing, Inc., 9600 J Southern Pines Blvd., Charlotte, NC 28217. (704)523-9500.

LAPTOPS THAT CAN'T WALK AWAY

Qualtec Data Products, Inc. has introduced a new anti-theft kit designed for laptop computers. The LOK-KIT 6 consists of a heavy-duty steel adhesive plate that is hinged on one end. The plate attaches to the bottom of the laptop so that the hinged edge is on the side of the computer. The braided cable threads through the hole in the hinged end



PRODUCT UPDATES

- **AST Research, Inc.** has released an updated software emulation package for the **AST 5251/11 Enhanced Plus Adapter,** providing greater productivity and efficiency. The software is available from the AST bulletin board at no charge. Floppy diskettes may be ordered through AST North American Services group. Contact: AST Research, Inc., 16215 Alton Pkwy, PO Box 19658, Irvine, CA 92716. 1-800-759-4278.

- **Farallon Computing, Inc.** has announced the latest version of **PhoneNet StarController**, an intelligent multiport repeater for LocalTalk networks. Series 300 replaces the original "Black Beauty" StarController. Contact: Farallon Computing, Inc., 2000 Powell St., Suite 600, Emeryville, CA 94608. (415)596-9020.

- **Fox Software** has released a free upgrade to its popular **FoxPro** database management software. The upgrade, **FoxPro 1.02**, is being sent automatically to all registered owners of single-user FoxPro, multiuser FoxPro/LAN, and FoxPro Run Time. Contact: FoxPro Software, Inc., 134 W. South Boundary, Perrysburg, OH 43551. (419)874-0162.

- **Samna Corp.** is offering a free update of **Ami Professional** word processor. **Version 1.2** includes compatibility with Microsoft Windows 3.0 and Hewlett-Packard New Wave. Contact: Samna Corp., 5600 Glenridge Dr., Atlanta, GA 30342. (404)851-0007.

- **Software Publishing Corp.** announced the release of **Harvard Graphics 2.3**. The new version integrates D**raw Partner, HyperShow** and a new **Chart Gallery**. All current users can upgrade for $75. Contact: Software Publishing, Corp., 1901 Landings Dr., PO Box 7210, Mountain View, CA 94039. (415)335-6440.

- **The Complete PC** announced a new version of **The Complete Half-Scanner for the Macintosh** that now supports up to 256 levels of gray at a list price of $399—$100 lower than the previous version. A free upgrade is available for registered owners of either The Complete Half-Page Scanner/400 or The Complete Page Scanner. Contact: The Complete PC, 1983 Concourse Dr., San Jose, CA 95131. (408)434-0145.

- **U.S. Robotics** has lowered the suggested list price on selected Courier-brand error-correcting modems. The price changes, for the **Courier HST Dual Standard, Courier V.32** and **Courier 2400cc** modems, are effective immediately. Contact: U.S. Robotics, Inc., 8100 N. McCormick Blvd., Skokie, IL 60076. 1-800-DIALUSR.

- An interim release of **WordPerfect 5.1** dated 3/30/90 enhances WordPerfect's spreadsheet linking, on-line help, printing, and pull-down menus. Users can order the 3/30/90 interim release program disks for $10. Contact: Information Services Dept., WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057. 1-800-222-9409.

TOP OF THE 386 LINE AT INTEL

TCI 386-25MHz: $3,250.
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- 4MB Memory
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- Dual Floppy Drive 1.2MB & 1.44MB
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- The Ultimate VGA-16 (512K)
- SVGA Color Monitor 14" (1024x768)
- Keytronic 101 Keyboard
- MS-DOS 4.01

Motherboard Features Comparaison:

TCI 386-25/33 (Perf.Ratio %)	Generic Taiwan 386-25/33
8 Layer, Dry Film Board (65%)	4-6 Layer, Photo Imaging (65%)
15ns CACHE RAM (50%)	25-35ns (not reliable for 25/33MHz)
PAL 7ns (30%)	PAL 10-15ns (slow down timing)
LED Diagnostic Display (5%)	Erro indicated by speaker only
42 Pheonix's run-time status (75%)	12 AMI's run-time status
High Quality Components (40%)	Non-US Made Cheap Component

Technical Specifications:

MOTHER-BOARD:	OMINITEL 386-25/33MHz
PROCESSOR:	Intel 80386-25/33MHz
CACHE MEMORY:	64K Direct Mapped (15ns Highest Speed)
CLOCK SPEED:	33/10MHz (Keyboard Selectable)
MATH CO.:	80387-25/33, Weitek 3167,1167, Cyrix
WAIT STATE:	0/1
MEMORY CON.:	1,2,4,8,32MB (All on motherboard)
MEMORY TYPE:	SIMM 70-80ns (256kx9, 1MBx9, 4MBx9)
BIOS:	Pheonix with Setup & Diagnostic Feature
BUS I/O:	AT bus (8MHz)
EXPANSION SLOT:	1x32-BIT, 6x16-BIT, 1x8-bit
POWER SUPPLY:	275 WATT, 110/22V Switchable (UR/CSA Approved)

Features:

Performance:	Landmark(V1.14) 25MHz=40MHz and 33MHz=53.8MHz
Compatibility:	Supports DOS,OS/2,Windows 386, Desqview 3886,UNIX,XENIX,NOVELL Operating
Memory On Board:	32MB on board
Memory Management:	Shadow RAM increases the speed of System BIOS and Video BIOS up to 300%. Supports EMS Memory, Memory Caching For Disk and RAM Disk.
8-Layer Dry Film Board:	High quality components were used; Simple, uncomplicated design for strong reliability.
LED Diagnostic Display:	Port 80 w/ LED display shows 42 run time status, good for programming and scientific applications.

THE ULTIMATE VGA-16

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- Suports up to 1024x768, 256 colors
- Compatible with VGA, EGA,CGA,MDA, and Hercules
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- FASTBIOS for increased performance
- Panning and scrolling
- Mixed graphics and text windows
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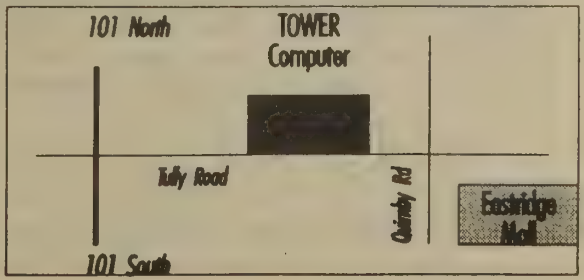


of the plate and is looped around an anchoring base and secured with the provided security padlock. When not in use, the cable and padlock store in the pouch that is provided. The hinged end of the plate may be folded flush with the bottom or the side of the laptop for easy transporting. Contact: Qualtec Data Products, Inc., 47767 Warm Springs Blvd., Fremont, CA 94539. (415)490-8911.

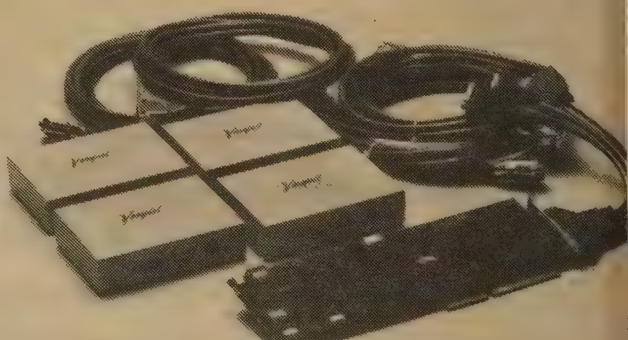
GLARE-FREE SCREENS

A GlareFree coating applied to your computer screen will eliminate 95% of unwanted reflections, according to the manufacturer. GlareFree costs $45 to $55 per screen, must be applied by a company representative and is guaranteed for two years. Contact: Don Moschella, GlareFree Coatings International, PO Box 1056, Lafayette, CA 94595. (415)943-5670 or 1-800-326-6610.

UNIX/NeXT

A FRESH VIEW ON A DRIVER FOR MULTIUSER GRAPHIC CONTROLLERS

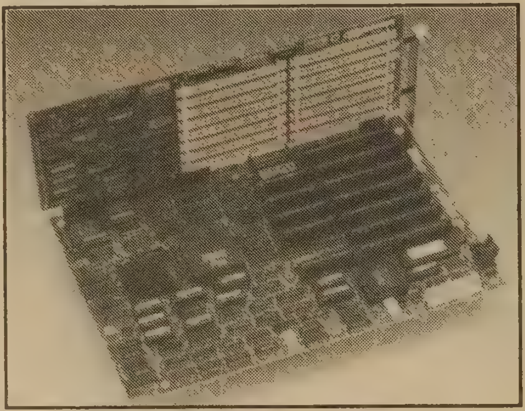
Viewport International has introduced a UNIX-based software driver for its multiuser graphics controllers. The VPT System 1000 for Hercules and monochrome applications and the VPT System 2000 for EGA applications utilize the power and economy of text and graphics available from a PC. The new driver lets CAD/CAM engineers and users of desktop publishing, database inquiry stations and ICON-based desktop manager software turn a PC or compatible into a UNIX-based host controller for up to eight user stations. (VPT System 1000, $1995; VPT System 2000, $1538) Viewport International, Inc., 4800 Great America Pkwy., Suite 410, Santa Clara, CA 95054. (408)748-8500 or 727-4356.



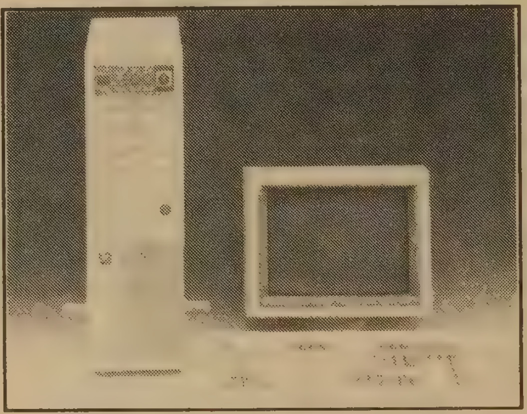
INSIGNIA SOFTPC FOR UNIX-BASED WORKSTATIONS

SoftPC, a PC software emulation program, allows IBM applications to run on the more than two dozen UNIX-based workstations, as well as Macintosh systems. To the host system, SoftPC looks like an application program. To a DOS program, it looks like an Intel-based IBM-PC. SoftPC makes maximum use of the facilities provided by its host system. This permits the PC user to take advantage of UNIX features such as windowing, and sharing files and peripherals. SoftPC includes MS-DOS v3.3 and GW-BASIC v3.0. Where windowing is available in the host system, SoftPC supports MIT X-windows, OSF/Motif and SunTools. Insignia Solutions, Inc., 254 San Geronimo Way, Sunnyvale, CA 94086. (408)522-7600.

THE WORLD'S BEST 486/386 PRODUCTS



286 25 MHZ MAINBOARD



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GC-4250V	486 25 MHz, 64 CACHE, 4 MB, SVGA/MONITOR, 1.2/1.44MB FDD, 2S/1P/1G	$4295
GC-3330V	386 33 MHz, 64 CACHE, 4 MB, SVGA/MONITOR, 1.2/1.44MB FDD, 2S/1P/1G	$2150
	486 25 MHz MAINBOARD	
GC-425ACX	80486 25 MHz W/O CPU, SOCKET FOR 80387/WEITEK 4167 WITH 64KB CACHE UP TO 128KB, 16 MB SIMM MEMORY EXPANDABLE, COMPATIBLE DOS, OS/2, UNIX, XENIX, 6 LAYERS, 8 SLOTS, BIG AT SIZE.	$1450
GC-425BX	80486 25 MHz W/O CPU, SOCKET FOR 80387/WEITEK 4167 16 MB SIMM MEMORY EXPANDABLE, BABY AT SIZE	$1250
	386 33 MHZ 64KB CACHE MAINBOARD	
GC-333ACX	80386 33 MHz CACHE W/O CPU, SOCKET FOR 80387/WEITEK 3167 8 MB SIMM MEMORY EXPANDABLE, WITH 64 KB CACHE, 6 LAYERS 8 SLOTS	$540
	FAX CARD	
GC-FAX	9600bps AUTO SEND/RECEIVE FAX, WITH TIME SCHEDULED SEND FEATURES WITH "PRINT CAPTURE", "SPOOLER" AND "BACKGROUND SEND & RECEIVE" FUNCTIONS	$285
	386 25 MHz BIG/BABY MAINBOARD	
GC-325AEX	25 MHz, BIG-386 MAINBOARD, W/O CPU, 8 MB MEMORY EXPANDABLE	$285
GC-325BEX	25 MHZ, BABY-386 MAINBOARD, W/O CPU, 8 MB MEMORY EXPANDABLE	$285
	386SX 16 MHz MAINBOARD	
GC-316SX	16 MHZ, BABY-386SX (P9) MAINBOARD	$325
	286 MAINBOARD	
GC-216	16 MHz, BABY-286 MAINBOARD	$180
GC-212	12 MHz, BABY-286 MAINBOARD	$115
	AT MULTI I/O & IDE INTERFACE CARD	
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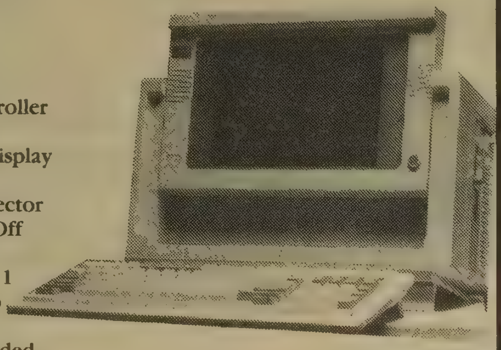

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286-12 MHz	$1675
386SX	1955
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Optional EGA & VGA	$599
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33 MHz w/64K CACHE Landmark = 59	$2599
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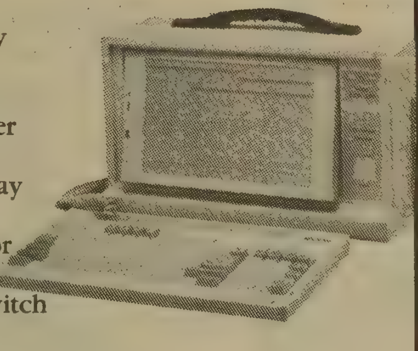

- 640x400 Resolution
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- 1.2 or 1.44 MB Floppy Drive
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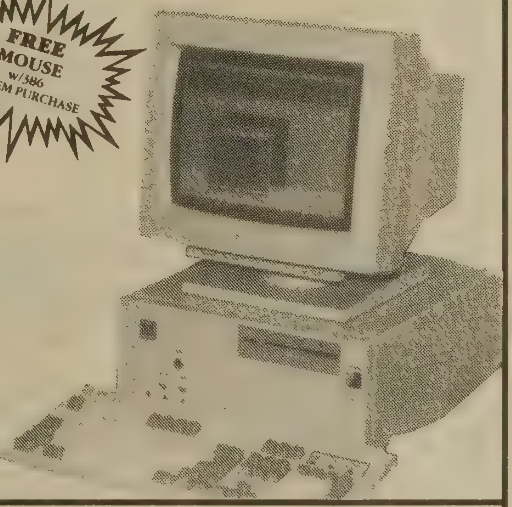
- 2 S/1 P/1 G
- HGC/CGA/MDA Display Modes
- Ext Monitor/Connector
- Contrast Ratio: 6:1
- 110/220V AC Auto Switch
- Carrying Bag

286-12 MHz	$1395
386SX	1650
386-25 MHz	1995
386-25 MHz w/32K CACHE	2150
Optional EGA Display	349

386 SYSTEMS w/40 MB

MONO/VGA

25 MHz Landmark = 34	$1525/$1840
SX-16 MHz Landmark = 22	$1230/$1550



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- 1 MB RAM Exp to 8 MB or 16 MB
- 40 MB Hard Disk 25ms
- 1.2 Floppy Drive Teac
- 1.44 Floppy Drive Teac
- 1:1 Interleave Controller
- MONO or VGA Monitor (800x600)
- MGP or 16 Bit VGA Card
- 101 Key Focus Click Keyboard w/Cover
- 2 S/1 P/1 G
- 200 W Power Supply
- Baby AT Case or Mini Upright
- Supports DOS, OS/2, UNIX, XENIX

60 MB Hard Disk . . . . + $170

PRINTERS:

Panasonic	
KXP1180	$175
KXP1124	285
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Hewlett Packard	
HP II P	975
HP Series II	1585
HP Series III	1625

LOGITECH:

Mouse (Bus)	$\$79^{95}$
Mouse (C9)	69^{95}
Trackman (Bus)	93^{95}
Trackman (Serial)	87^{95}
Scanner	175

MODEMS:

2400 Ext	$115
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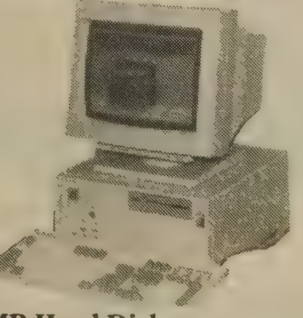
1200 Ext	70
1200 Int	55

286-12 MHz w/40 MB MONO/VGA . . . $895/1215



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- MONO or VGA Monitor (800x600)
- MGP or 16 Bit VGA Card
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SCO MPX MULTIPROCESSOR EXTENSION

The SCO MPX, from Santa Cruz Operation, Inc., is a multiprocessor extension to the SCO UNIX System V/386 Release 3.2 Operating System that unleashes the full power of the Compaq SystemPro and other multiprocessor computers using Intel 386 and 486 architectures. SCO MPX, for example, enables a single copy of SCO UNIX System V or Open Desktop to balance system and user tasks across all CPUs in the host multiprocessor machine. It is as if each CPU had the system to itself. ($865) The Santa Cruz Operation Inc., 400 Encinal St., PO Box 1900, Santa Cruz, CA 95061. (408)425-7222.

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386-33 CACHE	1519

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386-16 MHz Intel Chip Set	349
386-20MHz (noCPU)	319
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XT HD Contl (MFM or RLL)	57
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Monochrome 12"/14"	$79/95
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I/O Cards

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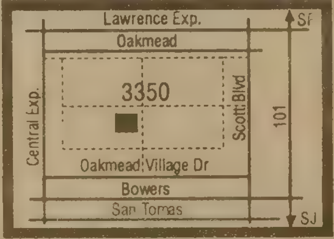

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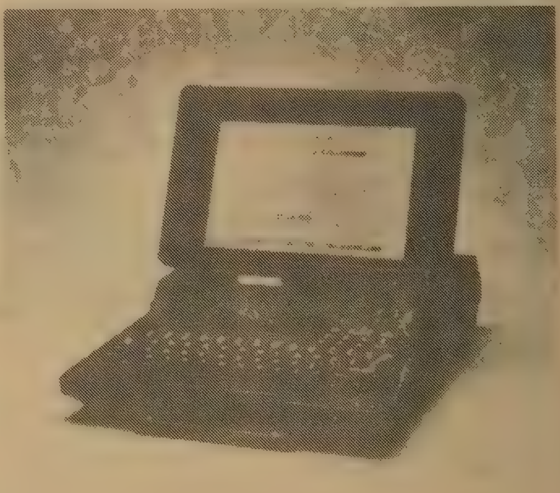
THE NEXT OFFICE

Who's Calling?, from Adamation, is a modular office automation program designed to fully exploit the NeXT computer. The office functions are managed by six program modules, with a client database that keeps track of all client information. The package implements all NeXT capabilities, including windowing, box instruction, voice response, networking and online help. Adamation offers user support in speciality consulting and application customizing. ($495, single user version) Adamation, Inc., 1435 Center St., Oakland, CA 94607. (415)452-5252.

PORTABLES

ECONOMY AND PERFORMANCE FROM ROSE HILL

Rose Hill has introduced two laptops to complement its line of desktop computers: the Rose286, a 16-bit, 8 or 12MHz laptop with 1Mb RAM, and the Rose386SX, a 32-bit, 16MHz laptop with 2Mb RAM. Both are expandable to 4Mb RAM, have a single 1.44Mb 3.5" floppy drive and a 40Mb hard drive. They have high-resolution, high-contrast LED screens and are compatible with CGA and Hercules mono graphics. Suggested retail price for the Rose286 is $2249, the Rose386SX is $2999. Rose Hill Systems, Inc., 4865 Scotts Valley Dr., Scotts Valley, CA 95066. (408)438-3871 or 1-800-248-ROSE.



MODEMS THAT GO WHERE YOU GO

Touchbase Systems has introduced two modems for Toshiba laptops. The WorldPort 2469i-TD combines 9600bps Group III facsimile function with a 2400bps data modem

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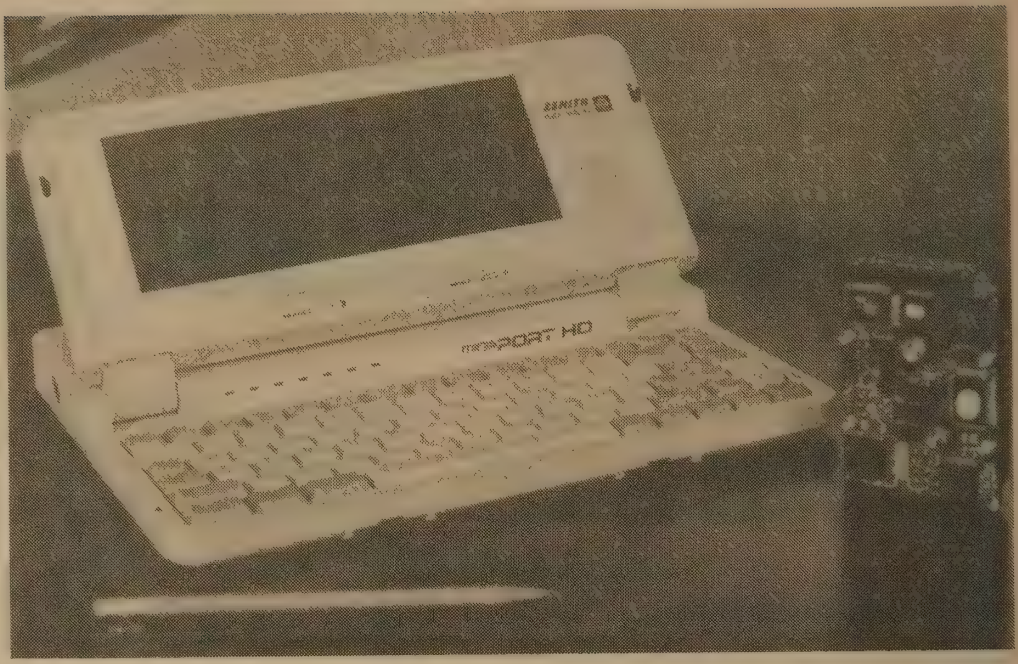
in a single package that has been shrunk to fit the laptop configuration. The WorldPort 2405i-TD modem uses the Microcom MNP Class 5 standard for error correction and data compression. Both models are compatible with Bell and CCITT transmission protocols and come with software, a two year warranty and unlimited, free telephone support. (WorldPort 2469i-TD, $599; WorldPort 2405i-TD, $399) Touchbase Systems, Inc., 160 Laurel Ave., Northport, NY 11768. (516)261-0423.

ALTIMA SYSTEMS 386SX NOTEBOOK

Combining 386SX technology, VGA display and a 20Mb hard drive, Altima has produced a portable that weighs 9.3lbs., including a battery, and measures 14" x 11" x 2". This 32-bit processor, featuring single-chip system logic to minimize power consumption, runs at 16MHz. It comes with 2Mb RAM, expandable to 8Mb, and a Hayes-compatible modem with send Fax mode. ($4999) Altima Systems, Inc., 1390 Willow Pass Rd., Suite 1050, Concord, CA 94520. 1-800-356-9990 or (415)356-5600.

ZENITH ENHANCES THE MINISPORT

The addition of a 20Mb 2.5" hard disk drive, a Crystal Bright screen and an improved processor makes the Zenith MinisPort HD ideal for the most mobile computer user, and powerful enough for both business and education applications. To minimize size and weight, the MinisPort HD features an external 3.5" floppy drive that runs off the system's power. The system features a 10MHz 80C88 microprocessor, switchable to 4.77MHz, and 1Mb RAM, of which 360K can be allocated as an ultra-fast "silicon disk drive." Rupp Corp.'s FastLynx LX, an easy to use, self-uploading data transfer program, and an abridged MS-DOS v3.3 Plus is stored in the non-erasable ROM. A complete version of MS-DOS is also factory installed on the hard disk. ($2799) Zenith Data Systems Corp., 1501 Feehanville Dr., Mount Prospect, IL 60056. 1-800-553-0331.



TOSHIBA UNVEILS FIRST RISC-BASED LAPTOP USING SUN'S SPARC

Toshiba has developed the world's first RISC-based laptop engineering workstation, the SPARC LT, AS1000/L10. This new computer is the result of a May 1989 agreement between Toshiba and Sun Microsystems, under which Toshiba obtained comprehensive rights to develop and manufacture computers based on SPARC architecture and the SunOS UNIX operating system. The SPARC LT, AS1000/L10 operates at 13.2MIPS and features 8Mb of main memory utilizing sixteen units of Toshiba's 4Mb DRAMs, a 180Mb hard disk drive, 64K cache memory, high-resolution active matrix monochrome LCD display and a 3.5" floppy disk drive. The list price in Japan is approx. $13,200. Toshiba plans to release the SPARC LT in the US end of this year or early next year. SPARC International, 535 Middlefield Rd., Suite 210, Menlo Park, CA 94025. (415)321-8692.

MICRONICS CUSTOM 386 PORTABLE

Micronics Computers, the largest American motherboard manufacturer, has introduced a 25MHz 386 portable based on their custom-designed chipset with faster and more reliable operation. The MP200, weighing

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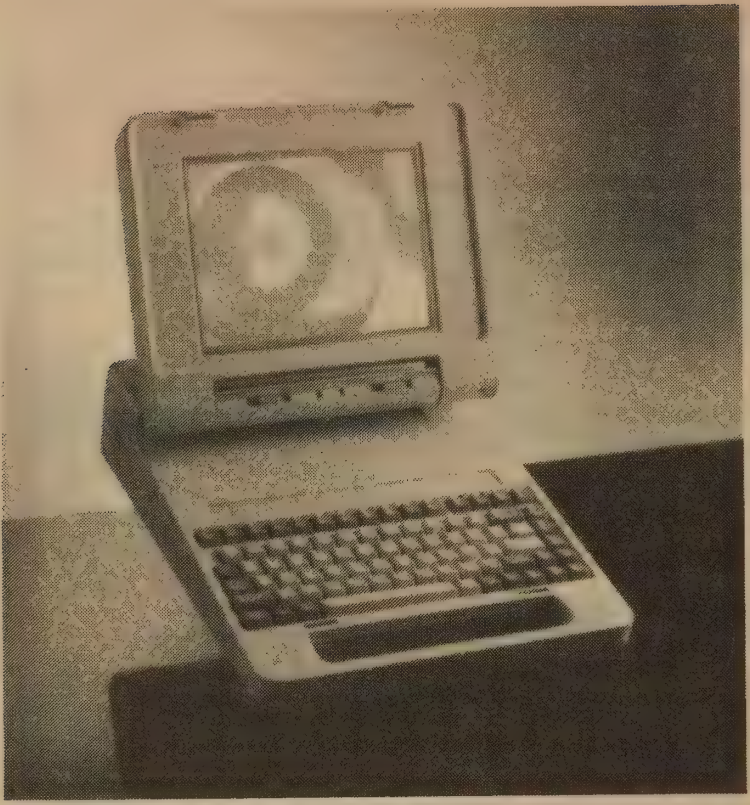

14lbs., includes a 40Mb 25ms hard disk drive, a 1.44Mb 3.5" floppy drive, and 1Mb RAM. An AT-compatible 8/16-bit, half-size expansion slot is available for a modem, LAN, or another AT-bus card. Micronics Computers Inc., 232 E. Warren Ave., Fremont, CA 94539. (415)651-2300. ■

Reviews

MS-DOS HARDWARE

MOUSE-TRAK

For: MS-DOS systems
Manufactured By: ITAC Systems, Inc.
Suggested Retail: $169-199, depending on model
Reviewed By: Woody Liswood

Perhaps the mouse is not yet obsolete, but with the Mouse-Trak trackball mouse, it becomes a close call. This is a 2" polished phenolic ball set in a cavity where it can rotate in any direction. By moving the ball, you control the cursor on the screen. A mechanical mouse works by moving a small ball which resides on the underside of a mouse. Moving the mouse across the table moves the ball, which causes the cursor on the screen to move.

The problems with mice are essentially twofold. First, rolling the mouse around on the table or on a mouse pad means the mouse ball picks up loads of dirt. You must periodically disassemble the mouse, clean the electrical and mechanical contacts and then reassemble. I must clean my Microsoft mouse every six weeks or so. Second, you must have a square foot or two cleared on your desktop in which to move the mouse around.

The Mouse-Trak changes all that. The trackball faces up so you manipulate it with your fingertips. Roll the ball to the right, and the cursor follows. However, your hand doesn't move. You are just moving and spinning the trackball with your fingertips. The trackball does not gather dirt and dust from your desktop. I've used my Mouse-Trak for about three months now and find no visible sign of dirt of debris on it. I took it apart to check and there is no visible wear or crud internally. I don't need much space for the mouse either—Mouse-Trak takes up a 4" x 8" space.

It did take some getting used to, though. I was trained to make large arm and wrist movements in moving the mouse cursor. At

continued on page 108

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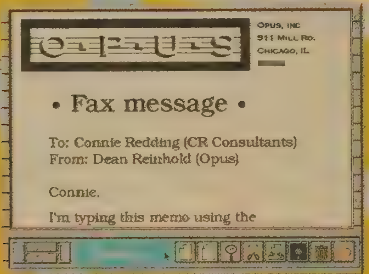

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From: Dean Reinhold (Opus)

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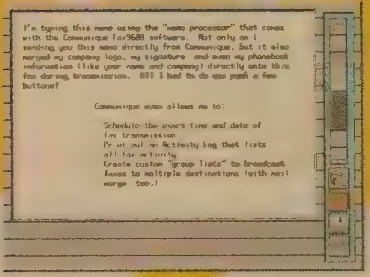

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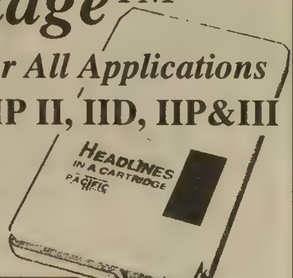

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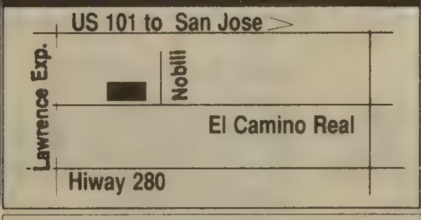

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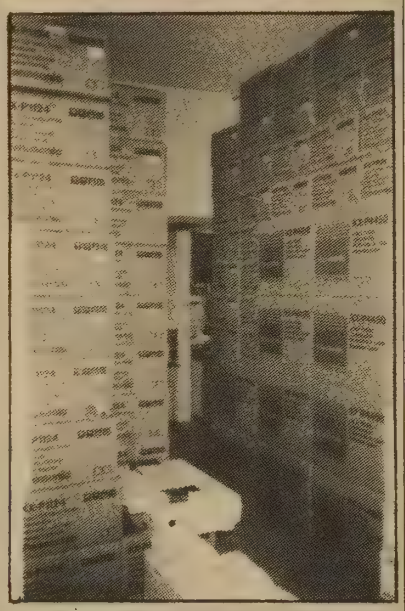

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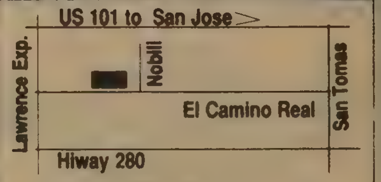

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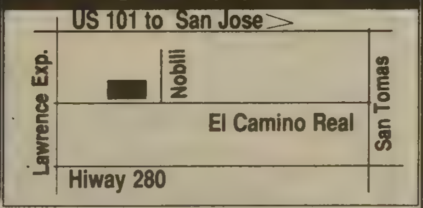

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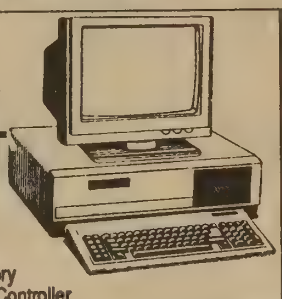

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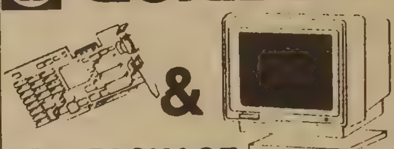

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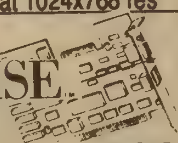

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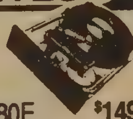

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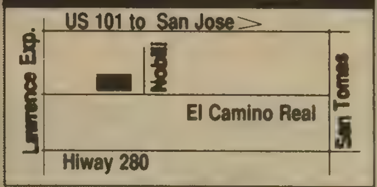

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continued from page 102

> **I think freehand drawing would be better done with the old mouse, but everything else works better, in my opinion, with the Mouse-Trak trackball.**

first, the trackball felt awkward. I forced myself to use it and after three days, I loved it. Now I just slouch back and work away; occasionally, I just pick up the entire unit and work from my lap.

I would not throw away my traditional mouse, though. I think freehand drawing would be better done with the old mouse, but everything else works better, in my opinion, with the Mouse-Trak trackball.

The Mouse-Trak has a built-in wrist rest. I find that much more natural to use than other trackballs which do not provide this feature. Mouse-Trak comes in both a serial and bus version. It works perfectly with everything I have tried it with, from all Windows-based software to Inset and Freelance Plus.

In addition to the normal two buttons, the Mouse-Track also has a special button which controls sensitivity. Press once and you reduce sensitivy by half, so that it takes twice as much rolling of the trackball to move the same cursor distance on the screen. Sensitivity can also be set through DIP switches on the mouseboard, or through software switches in the mouse driver.

Try it, you'll like it. I'll fight rather than switch back to my old mouse. (ITAC Systems, Inc., 3121 Benton Dr., Garland, TX 75042, 214/494-3073)

MS-DOS SOFTWARE

BATCHMASTER PLUS

Published By: Pacific Micro Engineering
For: MS-DOS
Suggested Retail: $295-995 per module; core package $800; full single-user system $6,000
Reviewed By: Robert D. Athey, Jr.

All of us who use chemicals of any kind are formulators of a sort; we buy, store, mix, package and use the chemicals, alone or in some combinations that do a specific job for us. Other people need information from our formulations, be they accountants, managers, regulators or customers.

Pacific Micro Engineering's BatchMaster makes it easier to get that information. The program was specifically designed for the paint manufacturing facility, but has since expanded into the inks and specialty chemicals world. A proposed upgrade in 1990 will give individual lot tracking along with the myriad of programs already included as options for the formulator; the company is now targeting the food and pharmaceutical industries. With the multiple programs now in the package, you can make up MSDS/HMIS information sheets for chemicals you use and their formulations; track chemical materials from delivery, through production processing, and to shipments; make up lab or plant production batch cards, based on master formulations, to be sized exactly to the ordered quantity; keep lab records of physical/chemical test data for each batch; monitor costs of production materials and products made as a function of time throughout the year; and generate monthly summary reports of materials purchased, used, in inventory, and shipped.

This sounds quite complicated, but it isn't. The programs are designed to be used through a series of simple menus presented by a main program. The user doesn't even have to know much about computer usage to be effective with this collection of programs.

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continued on page 122

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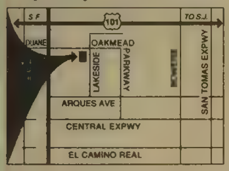

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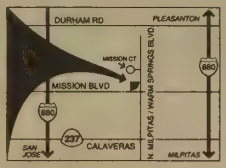

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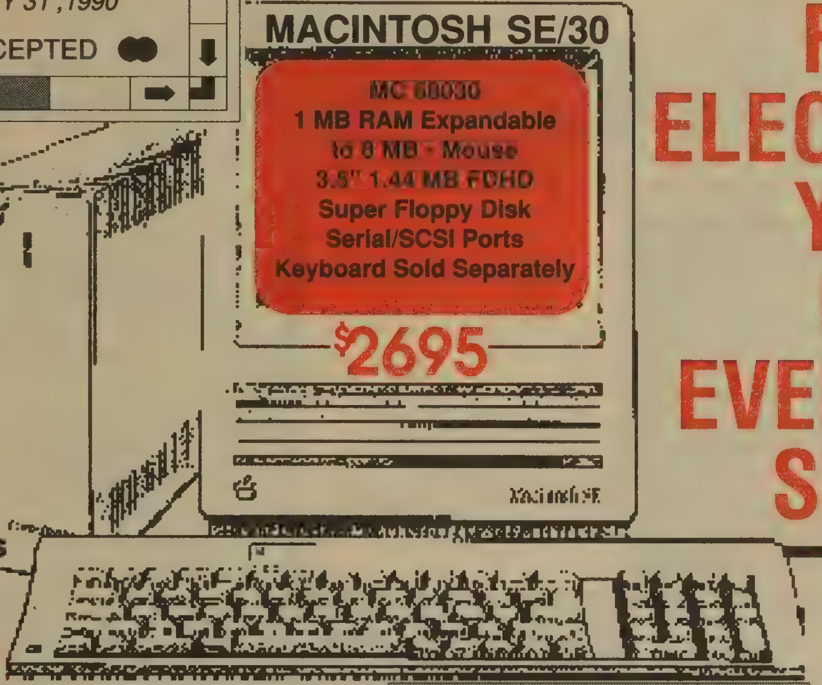

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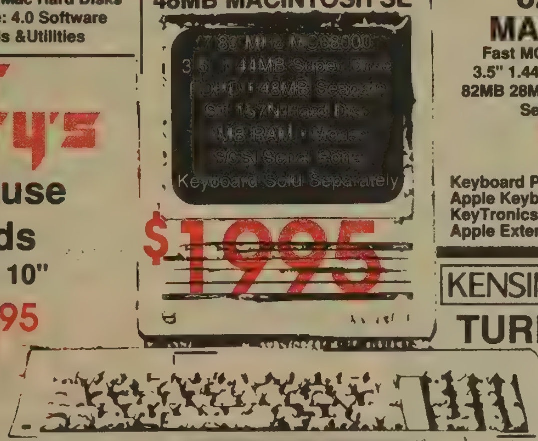

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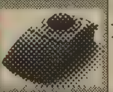

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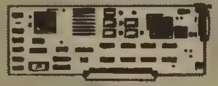

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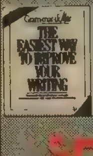

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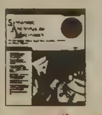

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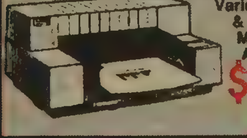

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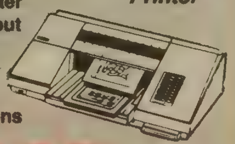

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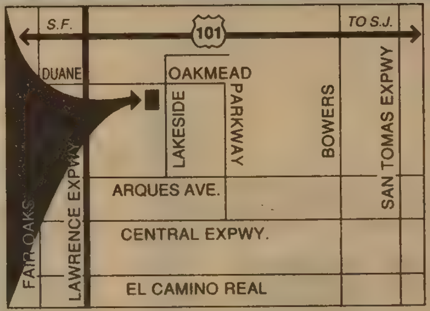

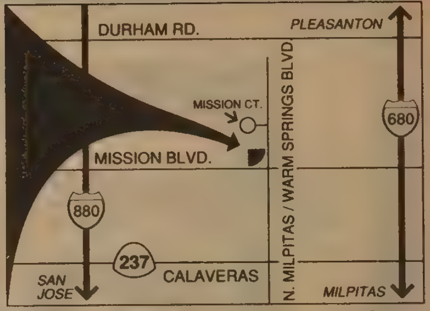

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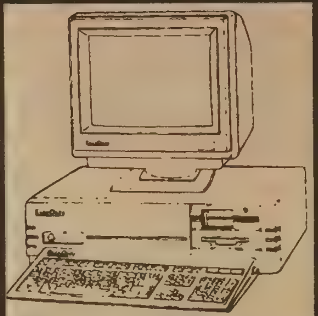

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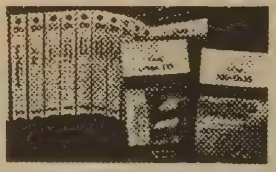

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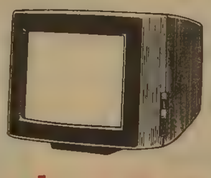

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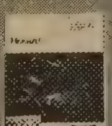

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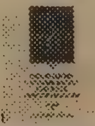

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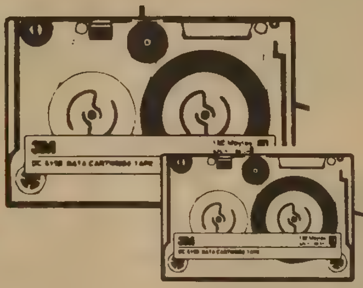

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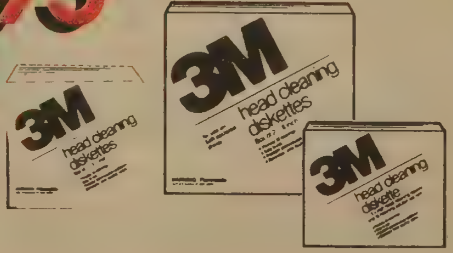
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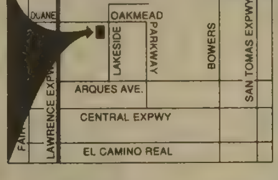

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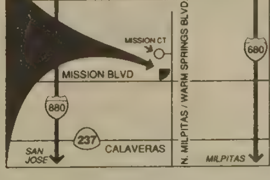

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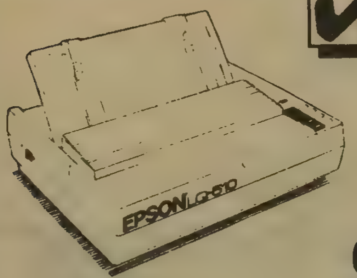

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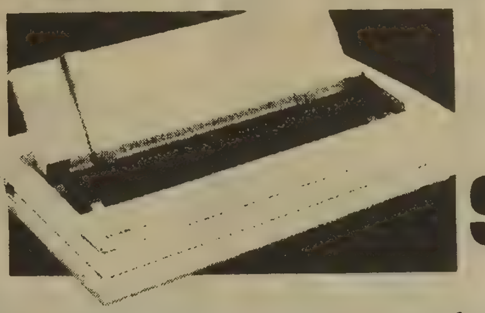

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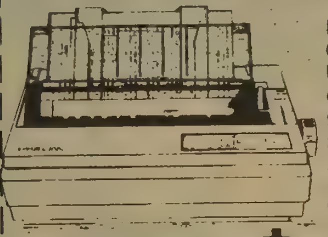

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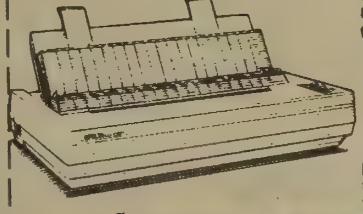

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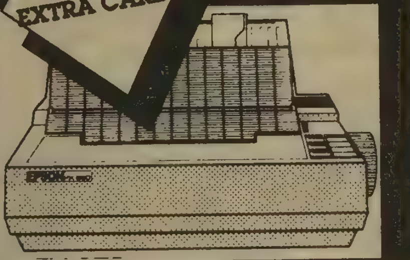

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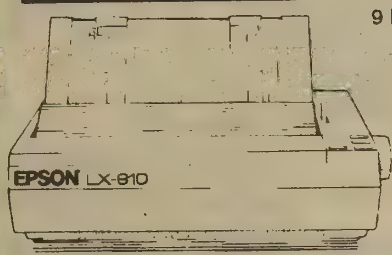

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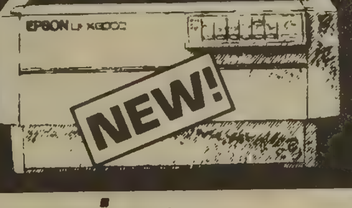

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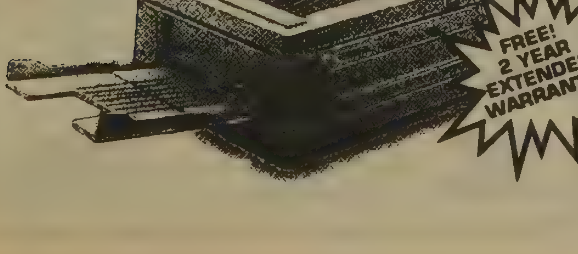

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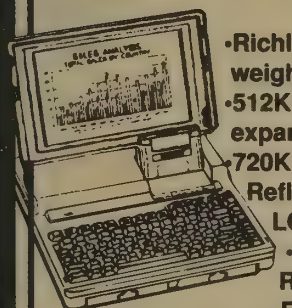

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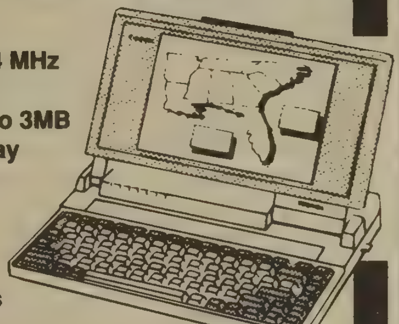

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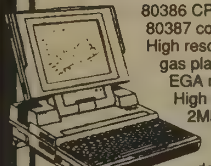

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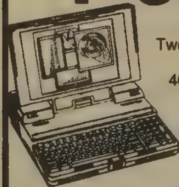

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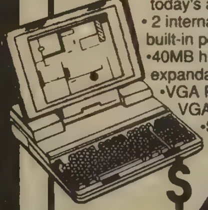

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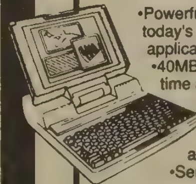

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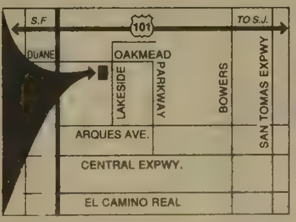

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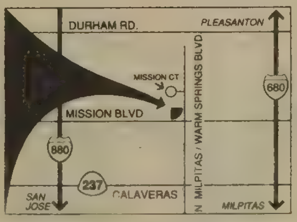

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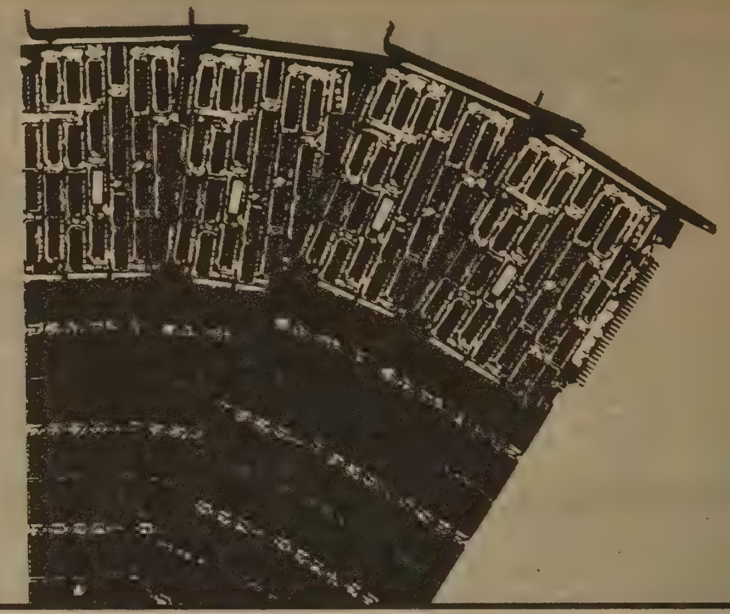

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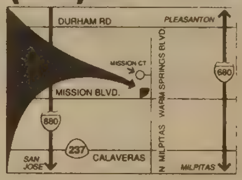

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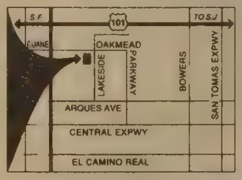

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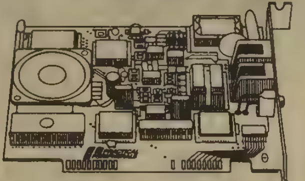

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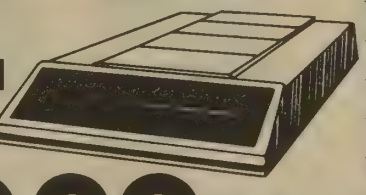

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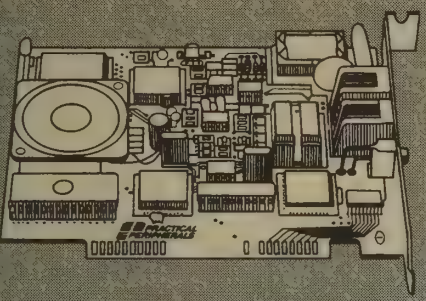

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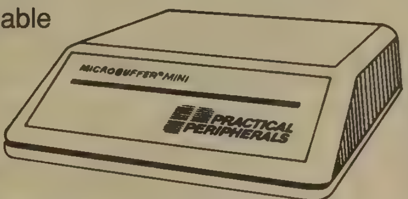

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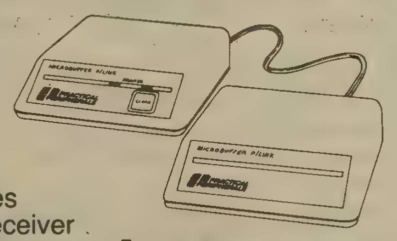

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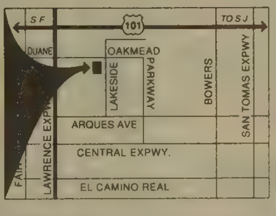
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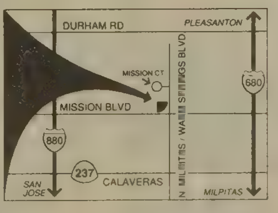
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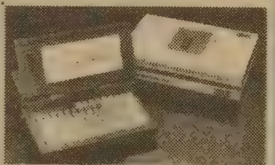

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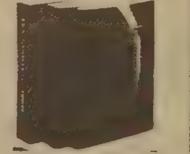

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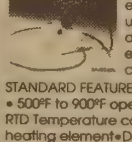

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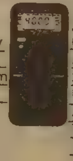

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COMPACT ANSWERING MACHINE

Answering system with Auto-Logic Operation, Tone Remote Control, Digital Display, Message Memo Recording and Remote turn on, Auto-Logic operation automatically rewinds, plays messages, stops at the last message and resets itself at the touch of one button

$39

MODEL KX-T1000

AT&T

CORDLESS TELEPHONE

AT&T does it again with the 4200 Cordless Telephone this compact unit is perfect for anyone. Value priced at...

$69

MODEL 4200

AT&T

2-LINE SPEAKER PHONE

The AT&T Memory Telephone 622 combines the function of a two-line telephone with a two-way speakerphone-perfect for small businesses. It allows group telephone conversations on either line and can combine conversations from each of the separate lines. Additional features include sixteen number speed dialing, programming pause, hold, line statusindictor, speakerphone and receiver volume control, flash and last number redial.

$89.95

MODEL 622

Panasonic

2-LINE EASAPHONE

''K'' Type Handset, 3 Number one touch automatic priority dialer, 12# Number speed dailer, Electronic hold, LED'S for line status, Conference calling, Redial, Pause, Programming time flash (700MLS), FCC Registered

$59

MODEL KX-T3110

SONY

CORDLESS TELEPHONE

Three number one touch autodailing high gain helical antenna resists breakage. Last number redail Tone/Pulse switchhable base unit can be wall mounted or used on desktop.

$97

MODEL SPP.50

AT&T

ADVANCED SPEAKER PHONE

The AT&T Speakerphone 730 combines a high quality, line powered. two-way speakerphone with convenient features such as thirty number memory dialing, LCD display, line-in-use indicator, call timer, receiver and speaker "rocker" volume control, last number redial, hold, flash, mute and programmable pause.

$99.95

MODEL-730

AT&T

BEEPERLESS REMOTE ANSWERING MACHINE

This unit features a digital message counter, and dual full size cassettes. You can even retrieve your messages from a remote location thru the beeperless remote function!

$119

MODEL-1320

Panasonic

COMPACT ANSWERING MACHINE

This compact answering machine is perfect for just about anybody. Fully featured, you can retrieve your messages from any tone phone. Plus, with Panasonic's Auto--Logic operation you hear your messages with the touch of a button. Other features include auto-interrupt, 12 function tone remote control, memory playback and call screening.

$59.95

MODEL KX-T1450

SONY

DIGITAL ANSWERING MACHINE

Ultra-Compact Design
IC For Outgoing Messages
Beeperless Remote Control
Remote Room Monitoring
MicroCassette Tape For Incoming Messages
Variable 2 -Digit Security Code Call Screening
Blinking LED Message Counter Toll Saver Feature
Conference Recording with Built-in Microphone
Save-Message Function

MODEL TAU-10

$59.95

SONY

COMPACT disc DIGITAL AUDIO

DISCMAN POTRABLE COMPACT DISC PLAYER

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16-track Random Music Sensor,
Shuffle play plus disc repeat mode,
Optional remote control,
LCD display with back light,
Unilinear Computer System with digital filter,
Rechargeble battery sysytem,

$169

MODEL D-4

Technics

PORTABLE COMPACT DISC PLAYER

Ultra-Lightweight design (12.6 oz.) with internal Ni-Cad rechargable or regular AA batteries, XBS (Extra Bass System) for deep, rich bass, 4x Oversampling (176.4kHz) digital filter and 1 DAC per channel for superb sound, AC adaptor Ni-CADS play up to 4 hours continuously, Multi-Function wired 1-Key remote w/volume control and stereo earphones, Resume play; Random play; LCD display; Optional car battery adaptor, 18-Track random access programming;Plays 5" & 3" CDs

$189.95

MODEL SP-XP2

PHONE-MATE.

TELEPHONE ANSWERING SYSTEM

Automaticly receives all the phone calls that you able to answer. Never miss another call!

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MODEL 6000

PHONE-MATE.

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$84.95

MODEL 7200

Panasonic

HANDHELD CELLULAR TELEPHONE

Wire-Line/non wire-line system select, Last digit clear, Dual selectable telephone number, Compact trickle charger, 832 Channel Compatible, Memory features, Display features.

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MODEL 3500

MITSUBISHI INTERNATIONAL CORPORATION

TRANSPORTABLE CELLULAR TELEPHONE

If's it's features you want, features the 800 has! Keep your 100 most frequently dialed numbers in memory and redial and redials busy numbers automatically. For most phones, hands free requires an external kit with installation required. Not this phone! All you need, for hands free is a microphone that we have in stock!

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MODEL 800-TPK

MOTOROLA

HANDHELD CELLULAR TELEPHONE

The most advanced cellular phone on the market today is the ultra classic. The compact design combined with a 101 number memory, dot matrix display and compact antenna make it the best value around. Just...

MR. RESCUE
From GTE Mobilnet

$898

MODEL 9800-XL

MOTOROLA

PERSONAL HANDHELD CELLUAR TELEPHONE

When the call comes in, just extend the antenna, open the mouthpiece, and talk. What could be simpler? Store 30 telephone numbers in memory, and see what number you dialed on the large L.E.D. display. Talk for 75 minutes and when you complete your call, this phone slips neatly in your pocket! Value priced at...

The GTE Mobilnet Business Club

$1048

MODEL PT-500

continued from page 108

Real-life users like [BatchMaster]. The plant manager loves his inventory control records being updated every time a batch is made. The technical director likes the automatic resizing of batches and the inclusion of all hazardous components in the MSDS as soon as a new batch card is devised.

between the computer and the parallel printer cable. That latter device is the copy protection checker, so the program can only be used on the one computer where all your sensitive formulation data is kept (how's that for making sure your trade secrets don't wander off!). Installation is simple, but should be done by someone who knows the technical side of computers. Printer installation and password setup should be done by an experienced computerist. We installed the program on a Televideo MS-DOS system with CGA and dot matrix printer, and on a DekTek MS-DOS clone with Everex speed-up and EGA kit, both desktop computers. We had no difficulties with either system. BatchMaster can be configured for network usage, too.

The system should be installed on a hard disk having at least 20Mb storage capacity. The disk will fill up fairly fast, especially if you use that same computer for your word processing. Be sure to back up the data files used by Batchmaster Plus at least weekly.

The recommended printers are dot matrix, as the output is 66 lines per page. No laser printers, unless you can find software that will compress the output by 13/16ths to give you 66 lines instead of the usual 64. I couldn't find it, but I've heard it exists.

Using the program is simple. The opening menu has almost 20 choices: call up a current standard sized batch card for modification, or print out the needed adjustments for the 3,000 gallon batch you need; call up the MSDS segment for printouts for the customer, the OSHA inspector, or the production worker who has a question.

The records management system allows you to print out all current batch cards, list all formulations not used in the past desired time period, print a complete set of MSDS records (for the files) and do the end-of-the-month inventories. The printed batch card not only has the list of ingredients to be used, but also has the special instructions inserted between ingredients and the physical properties to be tested at the bottom of the batch card.

Facilities having more than one user are advised to use the password system to generate one overall password for the system manager. All other users will then be given passwords that let them only into those subroutines where they need to be, and not the others. For instance, the lab technician may only use the batchcard development, the MSDS and testing records subroutines, while the production foreman may never see the batchcard development system and use only the MSDS, inventory, and production batch card systems.

Real-life users like the program. The plant manager loves his inventory control records being updated every time a batch is made, and the end of the month reporting on what was made is easy. The technical director likes the automatic resizing of batches and the inclusion of all hazardous components in the MSDS as soon as a new batch card is devised. Suffice it to say this is a program in use every day for most of the day. (Pacific Micro Software Engineering, 35-59th Place, Long Beach, CA 90803, 213/434-0011)

LABELPRO

Published By: Avery

For: MS-DOS (dot matrix and laser versions available)

Suggested Retail: $100

Reviewed By: Woody Liswood

Do you hate labels as much as I do? If you have struggled for hours and hours with laser printers, trying to get your favorite database or word processor to print labels, you're probably familiar with the hassles. What kind do you want—two across, three across, circles, file folders, or just large address and return address labels? Well, with Label Pro from Avery, your time in Label Hell may be over.

Avery, the largest producer of laser labels, now publishes LabelPro, which is specifically designed to work with all of their products. Other than the three-odd megabytes of space it requires on your hard disk, LabelPro is wonderful.

Picture this: you start the program, and then select, by graphic display or Avery part number, the labels you want to use. Next you can select a variety of formats to use with that label, again by scrolling through graphics which depict the format. Now, you either type in the text you want and/or specify any graphic you want printed along with the text. There are a variety of text sizes and styles to use, as well as centering, and justification options. There's a selection of graphics already created for your use.

At any time, you can preview your label onscreen. When you're done, insert the sheet of labels in the printer and print. Easy as can be, and the quality is superb.

Now for some really nice goodies. LabelPro

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Software
LABELPRO
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5116
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LABELPRO Dot Matrix

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- ✦ 6.7 Pounds
- ✦ 8.2″ (D) x 11.7″ (W) x 3.2 (H)

$1999

SAMSUNG S5200 LAPTOP COMPUTER

$1699

- ✦ 80286-12 MHz
- ✦ 1 MB Exp To 4 MB
- ✦ 640x400 Hi-Res Gas Plasma Disply
- ✦ 1.44 Floppy
- ✦ 32 MB Hard Drive, 28ms
- ✦ Parallel/Serial Ports

8088-10 COMPLETE

- ✦ 10 MHz
- ✦ 640K RAM
- ✦ 360K Floppy Drive
- ✦ Case/Power Supply
- ✦ Controller Card
- ✦ Keyboard
- ✦ Mono Monitor

$399

286-12 SYSTEM

- ✦ 12 MHz, 0 Wait
- ✦ 512K RAM
- ✦ 1.2 Floppy Drive
- ✦ Case & Power Supply
- ✦ HDD/FDD Controller
- ✦ 101 Keyboard

$429
★ Monitor Extra

386SX SYSTEM

- ✦ 80386 16 MHz
- ✦ 512K Exp To 4 MB
- ✦ 1.2 MB Floppy Drive
- ✦ Case and Power Supply
- ✦ HDD/FDD Controller
- ✦ Parallel/Serial Ports
- ✦ 101 Keyboard

$599
★ Monitor Extra

386-20 SYSTEM

- ✦ 80386 20 MHz
- ✦ 1 MB Exp To 8 MB
- ✦ 2.3 MB Floppy
- ✦ Case & Power Supply
- ✦ HDD/FDD Controller
- ✦ Parallel/Serial Ports
- ✦ 101 Keyboard

$899
★ Monitor Extra

386-25 SYSTEM

386-25

- ✦ 80386 25 MHz
- ✦ 1 MB Exp To 8 MB
- ✦ 1.2 MB Floppy Drive
- ✦ Case & Power Supply
- ✦ HDD/FDD Controller
- ✦ Parallel/Serial Ports
- ✦ 101 Keyboard

$999
★ Monitor Extra

386-25 SYSTEM

- ✦ 80386 25 MHz
- ✦ 1 MB Exp To 8 MB
- ✦ 64K Cache
- ✦ 1.2 MB Floppy Drive
- ✦ Case & Power Supply
- ✦ HDD/FDD Controller
- ✦ Parallel/Serial Ports
- ✦ 101 Keyboard

$1299
★ Monitor Extra

386-25 W/CACHE

386-33 SYSTEM

- ✦ 80386 33 MHz
- ✦ Cache Built-In
- ✦ 1 MB Exp To 8 MB
- ✦ 1.2 Floppy Drive
- ✦ Case & Power Supply
- ✦ Parallel/Serial Port
- ✦ HDD/FDD Controller
- ✦ 101 Keyboard

$1499
★ Monitor Extra

386-33

486 SYSTEM

486

- ✦ Landmark=115
- ✦ 1 MB Exp To 8 MB
- ✦ 1.2 Floppy Drive
- ✦ Case/Power Supply
- ✦ HDD/FDD Controller
- ✦ Parallel/Serial Ports
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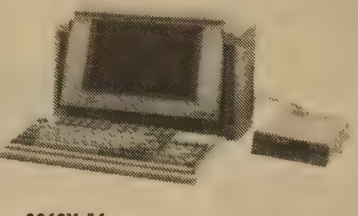

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- 5 Slots, external 5 1/4" 25 Pin Drive Port
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- VGA (8 gray scale mono LCD)
- 1 MB Memory, Expandable to 5MB
- 40 MB Hard Disk (25ms)
- 1.44 MB 3.5" Floppy
- 1 Parallel, 2 Serial Ports
- Toshiba Compatible Expansion Slot
- 2 Hour Battery Pack Available
- 80/100MB Hard disk Available

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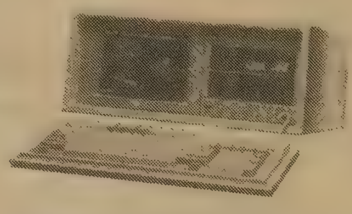

- 80386SX 16/8 Mhz Norton SI 17/6
- 1 MB of RAM expandable to 16 MB
- 1.2 MB Floppy Drive
- 2 Ser port, 1 par port, 1 game port
- Dual Floppy Hard Controller
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McTek 286/12/16 Mhz

FREE KEYBOARD DRAWER

- 80286 12/6 Mhz
- 1MB of RAM expandable to 4 MB
- 0 Wait State
- 200W Power Supply
- 1.2 MB Floppy Drive (Teac)
- 2 Ser port, 1 par port, 1 game port
- Dual Floppy/Dual Hard Controller
- Monochrome Graphic Card
- 12" TTL Monitor
- 101 Enhanced Keyboard
- 40 MB Hard Disk (28 ms)

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FREE KEYBOARD DRAWER

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- 0 Wait State
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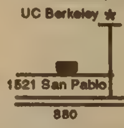

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works with dBASE and other types of file formats directly. I have a few mailing lists in a comma delimited format, and most databases can output delimited formats. LabelPro lets you create the text for the label by calling this information from a field in a database. The process works better than any I have worked with before. When you tell LabelPro what format the database is in, it displays the first record of that database for you. You just identify which field goes where. Fantastically easy.

LabelPro comes with a variety of graphic images for you to use. If none of them fit your fancy, you can import any PCX file.

LabelPro can be used to build your own mail list database. It comes with a predefined database which contains the typical name, address, phone number, and title fields. Personally, I would use my favorite database to do all address list management, then convert it to a comma delimited format when I wanted to print labels.

Lastly, LabelPro comes with a special sheet of paper for setting alignment in your laser printer. During the installation process, which takes quite a few minutes, you will be instructed to place the special laser alignment paper in your laser printer. The printer will print some lines through a preprinted section of the paper. The printed line will match up with numbers on the paper. You then type those numbers into LabelPro. No other program I use has any special alignment routines for the laser printer.

I tested LabelPro on a 20 MHZ ALR 386 with an UltraVision display adapter on a Video Seven EGA board, a Hercules VGA and an NEC VGA graphic engine board, an original model Compaq in CGA monographics, and an AT clone with a Hercules display board, all with an HP LJ II. It worked perfectly in all configurations.

SPINRITE II

Published By: Gibson Research
For: MS-DOS
Suggested Retail: $59
Reviewed By: Robert D. Athey, Jr.

Aside from backing up the data on your hard disk frequently, it's important to periodically (about every six months) clean off the disk and redo the low-level format. As you may remember, the hard disk storage of data is magnetic. Apparently the magnetization of the

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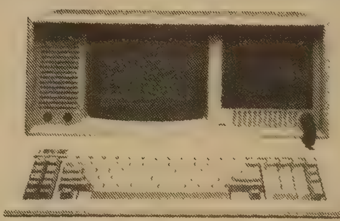

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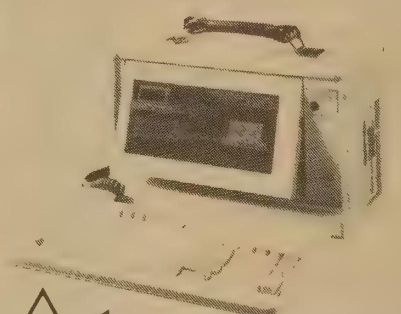

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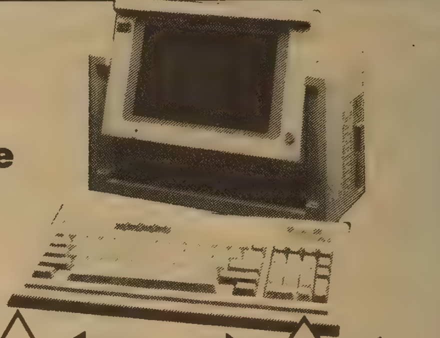

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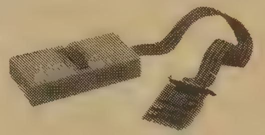

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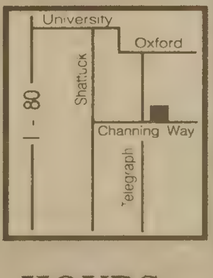

HOURS:
Mon-Fri 9:30-6:00
Sat 11:00-5:00

The details of the industry standard for a game interface would have to be hammered out between the electronic engineers and the marketing wizards, but there has to be a standard. The miraculous success of the MIDI standard in electronic music proves the possibility of such a thing.

disk deteriorates over time due to erasure, write-over, time, and other factors. This translates into Bad Sector messages and data loss.

Done conventionally, the backup-and-reformat process is long and tedious. The low-level format alone takes a minimum of two hours for a 20Mb disk. There are programs that will test the disk and mark off the bad sectors so they won't be used, a good interim measure. But a new product from Gibson Research in Southern California saves you a lot of trouble.

SpinRite II is a recent upgrade to Gibson's SpinRite hard disk utility. The program serves several purposes, all of which make your hard disk usage more efficient. Its most useful feature is that it will reformat the hard disk *with the data on the disk*, and maintain the data so you don't have to reload the disk afterwards.

The older program found an empty sector, low-level, formatted it, and then loaded the data from another sector onto the newly formatted one. The now-emptied sector was reformatted, reloaded with some other data, and the program continued through the whole disk. With the new version, the reformat takes up a file, reformats the space it was on, and replaces the file in its old location.

The program is easy to use. Installation is necessary, but the new version has streamlined the process considerably.

SpinRite program will test your hard disk for the optimum data interleave. The hard disk spins so fast that data written on it is not written to contiguous sectors; the data is written with empty sectors between successive writes, and its location is kept in a tabulation so your computer can find it all when it's needed. On most computers, this "interleave factor" (the spacing between data segment sectors) is preset according to the arbitrary decision of some design committee. However, depending on the disk rotation speed and the operating clock speed of your computer, the optimum interleave can vary from computer to computer, especially if you've added speedup kits, turbo cards, or other goodies.

SpinRite tests for optimum interleaving by writing a few tracks of test data, and then measures the time needed to recover it. It sets up a tabulation of the recovery times needed for interleaves of 1:1 to 1:8, and lets you choose the interleave you want, even though it recommends the most efficient.

SpinRite will print or file various reports on the status of your machine and hard disk. For instance, it will tell you how many bad sectors exist on your hard disk, and how many it has been able to mend. It will tell you your hard disk operating parameters (rotation speed, encoding technique, sectors per track, and so on).

The low-level reformat and interleave change option does take some time, so it's best done overnight. The new version is faster, but still takes four to six hours to renew a 20Mb hard disk, instead of the eight it used to take.

In this day of expensive software, I find this $59 package a real value as a productivity tool. (Gibson Research Corp., 22991 LaCadena, Laguna Hills, CA 92653, 714/830-2200)

MACINTOSH SOFTWARE

COACH PROFESSIONAL 3.1

Published By: Deneba Software
For: Macintosh
Suggested Retail: $195
Reviewed By: Matthew Leeds

I'm always on the lookout for new writing tools. Finding ways to make my work easier leaves me more time to look at new software; perhaps I'll find yet another tool. This endless loop can go on for months at a time.

At least now I'm no longer looking for a new spelling checker.

Coach Professional includes a 100,000-word thesaurus, a 188,000-word spelling dictionary with legal, medical, and technical libraries, and a definitions dictionary with over 85,000 words.

Coach can be used in a variety of ways. It's a desk accessory, and is fully compatible with all major word processors and page layout programs. It can be run in interactive mode, checking spelling as you type, or in batch mode, checking your entire document and then displaying a list of misspelled words. It will also check for double words, abbreviations, correct use of quote marks and dashes, and proper capitalization. You can also use Coach Pro to hyphenate your document.

Nice touches include a control panel interface that lets you set the applications that Coach Pro will automatically open in, hot links between the dictionary and the thesaurus, user customizable hot-keys. There's unlimited support for user libraries, and Deneba's new version of Canvas will use the same dictionary, saving disk space. I've even used Coach Pro in interactive mode to check my spelling while adding information into a database. A very nice product. (Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122, 305/594-6965)

MACINTOSH HARDWARE

GRIDMASTER GRAPHICS TABLET

Manufactured By: Numonics
For: Macintosh
List Price: $449/469
Reviewed By: Mike Markowitz

The mouse is wonderful for moving a cursor around on a screen, but hopeless for tracing an outline, or freehand sketching. Professional artists have always preferred the graphic tablet, but high cost has limited its use. With a precisely spaced grid embedded in a multi-layer circuit board, the conventional tablet is expensive to manufacture, and tricky to set up and calibrate. The Numonics GridMaster is a technical breakthrough that brings the advantages of the tablet within reach of more Mac users.

GridMaster is a flexible mat only 1/32" thick, with an "active" area 12" square. (A larger version is also available.) Weighing about 12 ounces, it can be rolled up and stowed in a drawer. It plugs into the modem port of the Macintosh and requires no additional power supply. Numonics claims a resolution of 1000 lines per inch, with an accuracy of 0.01". The trick was the use of conductive ink to print a fine x-y grid onto a plastic sandwich of 11 layers. The tablet is actually an antenna array, with the stylus or puck as a tiny transmitter. The signal processing includes correction for "pen tilt," so that the tablet accurately detects the stylus tip at any angle.

The Control Panel's Mouse speed should be set to "Slow/Tablet." You install a CDEV in your system folder, allowing you to select tablet only, or tablet and mouse together.

Some users may need practice to get a "feel" for the tablet's active area, in relation to the screen. It was helpful to put a mark at each point on the tablet that corresponded to a corner of my 13" monitor. This made it easier to crop and center artwork. I tested GridMaster with MacDraw II, Claris CAD, SuperPaint, Studio 8, HyperCard, and other software, without encountering problems. The stylus gave excellent results with MacCalligraphy, a program that emulates writing and painting with the Japanese brush. The tablet is so sensitive that you can trace from the cover of a magazine, or a page of a book, as long as the thickness of the pages is less than a half-inch. The only hardware incompatibility I found was with the Felix pointing device—solved by unplugging Felix and removing its CDEV from the System

continued on page 196

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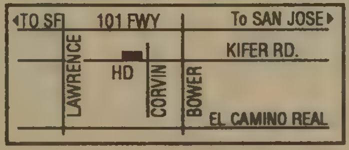
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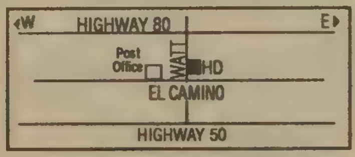
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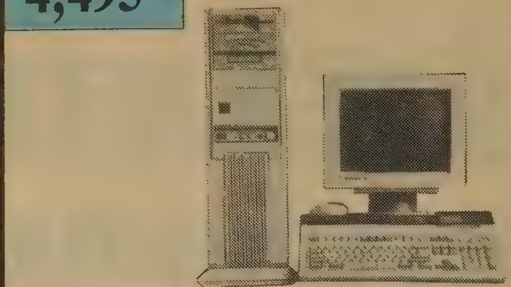

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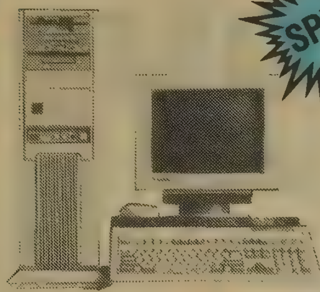

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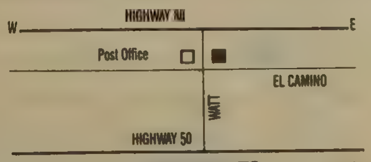

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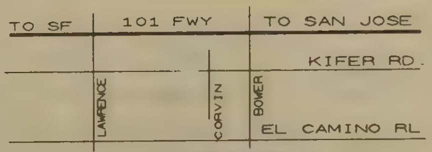


SANTA CLARA

Amiga CD-ROM

The Commodore Dynamic Total Vision May Be The Machine That Defines The Home Market For The '90s

BY MATTHEW LEEDS

In a bold move to take the lead in interactive entertainment systems, Commodore took the wraps off of an impressive new machine called the Commodore Dynamic Total Vision (CDTV). In a nutshell, this is an Amiga 500 melded with a CD-ROM drive in a case that owes more to the consumer audio market than the computer market.

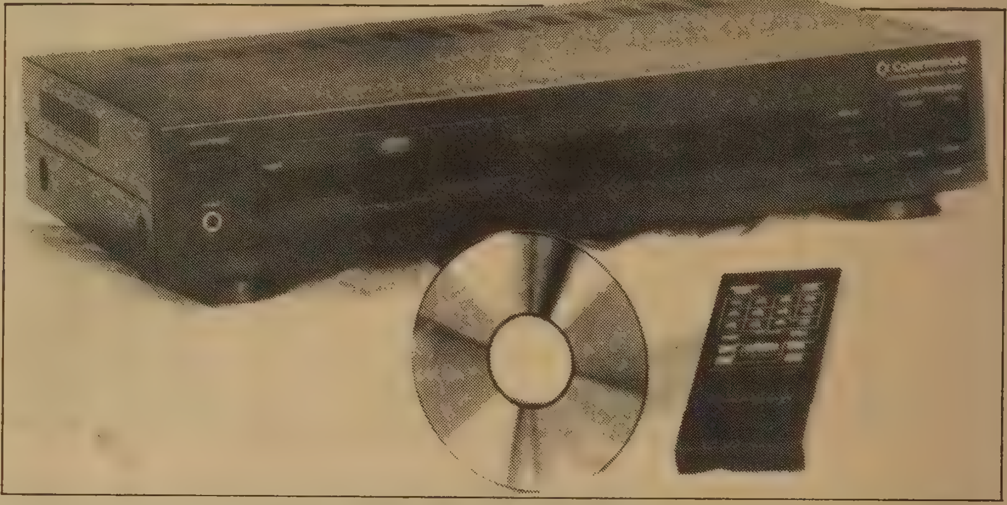
Code-named "The Baby," the CDTV system has been in development for several months. Commodore has been refining the concept, soliciting input from the developer community and marketing channels, and has come up with what may well define the home market for the rest of this decade.

AMIGA

The technical specs are impressive. Imagine an A500 with the floppy drive and keyboard eliminated, stuffed in a case the size and shape of a consumer CD-audio player. Swap the audio player for a CD-ROM drive, add a front card port (similar to a cartridge port) for a non-volatile RAM or ROM card with a capacity up to 64K, add 2K of internal non-volatile RAM for storing high game scores and personal preferences settings, lose the edge connector but add two internal slots (one for a genlock, one for a SCSI or LAN card), give it color composite video and Y/C outputs plus RF, add in headphone jacks, an infrared remote control and MIDI in/out.

If that's not enough, give it a full megabyte of chip memory, a very nice-looking front panel LCD display with white characters on a black field and software control over the display, built-in high speed decompression for graphics, audio and other data, an ISO 9660 file system handler, optional infrared joystick, mouse, trackball and keyboard (or hardwired), an expansion module to house a hard drive, floppy drive, or modem, a two-player infrared interface, and give everything a slick high-tech black finish.

Oh yes, also make sure that the CD-ROM player will also handle CD-audio, give it eight times oversampling for excellent audio specs, and add in support for the CD+G graphics subcode found on some CD-audio disks. Bundle the whole thing up, sell it through the same marketing channels as other consumer electronics products, and make certain that the list price is below $1,000.



THE CONSUMER AND CD-ROM

Impressed so far? You should be. Until now, no manufacturer has been able to make a dent in the consumer CD-ROM market. The total installed base of CD-ROM players is around 350,000, mostly in businesses using CD-ROM-based databases. Apple has gotten nowhere with their CD-ROM player, mostly because the player alone has cost consumers around $800. You still needed a Macintosh to hook it up to, and the bulk of applications available for it have been black and white compilations of data, not products for the consumer market.

Picture the average user: the CDTV system will be connected to the television and stereo system. Users will control everything via a single handheld infrared remote unit. This unit has a diamond layout four-key cursor control, two select buttons (think of left and right mouse buttons), ten function keys and a Shift key, CD-audio controls like play/pause, forward/reverse, volume and stop. They can use on-disk encyclopedias, atlases, almanacs, foreign language instruction, learning programs, and lots of high-quality entertainment software.

Most users will never realize that they have brought a computer into their home. They will never have to overcome the fear of learning to use an intimidating foreign-looking device, and will be able to expand their system by adding a real keyboard, a printer, hard disk (probably explained as just a storage device), a modem (just like the TV is connected to cable), and a genlock (titles and sound effects added to home videos).

You could dismiss CDTV as just a yuppie Nintendo clone. I suspect that would be a mistake. Both computer manufacturers and entertainment software developers initially dismissed Nintendo as just an Atari game machine clone; they were very wrong. There has been much discussion of why the Amiga has not had the success many feel it deserves, but Commodore's track record with consumer marketing of the C64 shows that they have a good idea how to handle that end of the stick.

CDTV is the first product from a new division of Commodore called Consumer Interactive Products. The newly hired general manager of this division is Nolan Bushnell, founder of Atari, Chuck E. Cheese restaurants, inventor of "Pong," and a man who has recently been involved in several startup companies working with technology that connects computers and video for the Mac. The irony here is far too obvious for most; perhaps it's only appropriate to note that the consumer computer industry is still a relatively small sandbox.

THE FUTURE: CD-ROM, CD-I, ETC.

One way to gain a perspective on

Copyright © 1990. All rights reserved. Matthew Leeds has been involved in the high tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.

NEC PORTABLES

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ProSpeed CSX	**First color display laptop computer.** 80386SX/16 MHz CPU/clock speed; up to 4 MB RAM; 1.44 MB, 3.5″ floppy disk; color LCD/VGA/EGA; parallel, serial, RGB, monitor, external FDD, modem	42 MB $4795 100 MB $5395

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> You could dismiss CDTV as just a yuppie Nintendo clone. I suspect that would be a mistake. Both computer manufacturers and entertainment software developers initially dismissed Nintendo as just an Atari game machine clone; they were very wrong.

Commodore's chances would be to take a look at what others are doing. IBM has been rumored to be working on its own CD-ROM machine, and in fact several computer trade publications have discussed their ideas on the possible specifications for such a machine. Even Bill Gates has detailed his ideas on what a likely MS-DOS-based CD-ROM machine might contain.

There's fairly general agreement that features would include an AT-class machine with VGA display, 30Mb hard drive, 2Mb of memory, CD-ROM drive, most likely Windows 3.0, and a price point around $3,000. Tandy currently sells its model 2500 machine with similar specs and a CD-ROM drive for a similar price.

Sometime next year, Phillips, Sony, and a whole bunch of other consumer electronics companies will bring CD Interactive (CD-I) to market. To add a little historical perspective, Phillips and Sony first announced CD-I in 1986. The delays have been due to standards issues and the addition of full-motion video. Authoring tools were slow in coming and expensive, and the image quality did not match consumers' expectations. In fact, even now the display is limited to 320 x 200. Although no firm pricing has been set for CD-I players, since they are targeted at the consumer market, they're likely to be priced below $1,000.

CD-I may offer some competition for CDTV. It may be priced competitively; it will have some major players behind it, with the advertising and market penetration they can bring to the table, and it has some attractive features. However, by the time it finally arrives, Commodore may have CDTV firmly entrenched. You can look for CDTV to arrive at your local retailer this fall. ■

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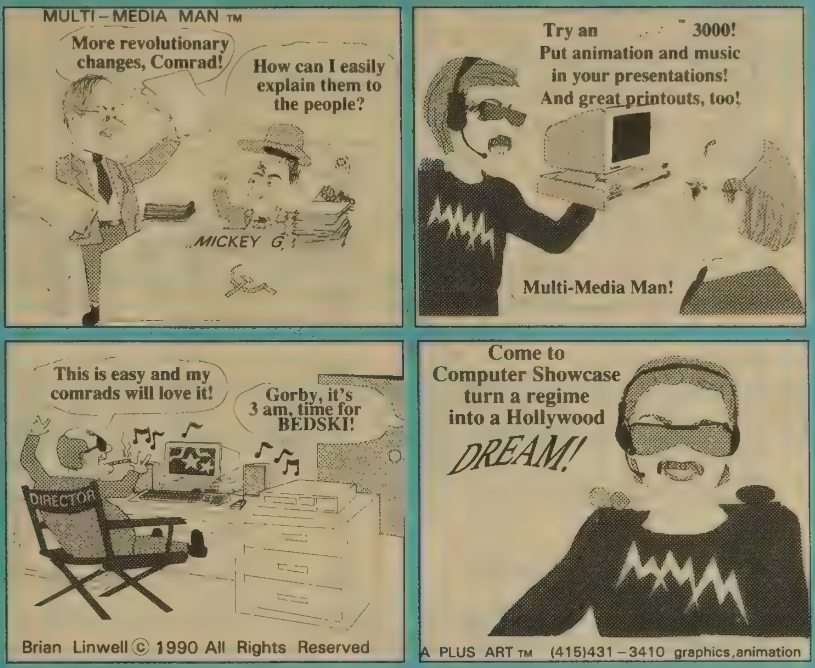

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Telecommunicating With The ST

BY DAVID HAWKINS

One of the most interesting things you can do with a computer is get it to talk to another computer—reach out and touch the world. Normally this involves getting a modem, a device that helps exchange electronic data through the phone line. (You can also hardwire two computers together, but then they'd need to be pretty close to each other.)

ATARI ST

MODEMS

Fortunately modems and cables are easy to buy and use with the ST. Just about any new modem should work—I have three modems and they've all worked perfectly.

The main consideration is how fast a modem you want and/or need. I started with a 1200 baud modem and it was okay, but when I got a chance to move up to 2400 baud I appreciated the speed. It's possible to get good 2400 baud modems for around $100 or a little more.

The next step up in speed is 9600 baud. Unfortunately the 9600 baud modems aren't standardized yet; some of them have trouble talking to each other and some don't work well with 1200 or 2400 baud modems. Prices are a little steeper, too—around $800 and up. Personally I'm reluctant to spend more for the modem than I did for the computer.

As far as cables go—the modem port on the ST is a standard RS-232 connection. I use the same cable to connect this modem to my PC and to my ST.

DO YOU NEED A TELECOMMUNICATIONS PROGRAM?

Fortunately you don't need a telecom program to telecommunicate with the ST. There's a terminal emulator built in to the standard Desktop. Change the RS-232 settings, then pull down the VT-52 emulator.

After this, whatever you type goes straight to the modem, which can then log into another system for you. For example, if you wanted to call a BBS and the phone number is 555-1234, you'd type ATDP555-1234 ("AT" gets the modem's attention; "DP" says to dial using pulse dialing, and then you type the phone number).

While it is handy to have the terminal emulator there, it's limiting at times—you can't do things like automatic dialing and file transfers. However, I've found that about 98 percent of what I do can be done with only the terminal emulator. It's especially handy when I'm in a game where there is still a Desktop bar; I can pull down the terminal emulator and use it without interupting my game.

USING TELECOMMUNICATIONS PROGRAMS

The telecomm program I use the most is Flash, $29.95 from Antic Software, 544 Second St., San Francisco, CA 94107, (800)234-7001.

It has a built-in text processor I use to compose messages before uploading them to another system. It supports VT-100 emulation, which works better on some systems. For a long time Flash's VT-100 emulation was better than anything available for any price on the PC or the Macintosh, but they're starting to catch up.

Antic also sells a program called Shadow that can do file transfers in the background while you run other programs on your ST.

Another good telecomm program is Interlink ST, $39.95 from Intersect Software, 3951 Sawyer Rd., Suite 108, Sarasota, FL 34233, (800)826-0130. I've found that people disagree about which of these two, Flash and Interlink, is easier to use. The big plus for Interlink is that it supports automatic redialing, which can be handy if you're trying to get into a busy system.

TELECOMMUNICATING

So you've got a modem and software—now what? You call another system.

There are basically three choices here—an individual, a BBS, or a conferencing system.

If you need to get a file from your computer to Mary, you can use your modem if Mary has a modem on her computer. You get in your telecom program and call Mary's phone number; she has her modem answer the phone. You can type messages back and forth, or just go ahead and start the file transfer. This can be handy if you have different types of computers (Atari/IBM/Mac/Amiga/etc.) and need to exchange a text file. I've also had to do this when moving files from my laptop to my ST.

To call a BBS, check the listings at the back of *MicroTimes* and pick a system that has interests matching yours. You might want to call an Atari BBS to find out what the newest programs are, or get help with a game. There are programs that allow you to set up your Atari as a BBS, but you would probably want to talk to someone running an Atari board to learn how to do this.

Conferencing systems, like CompuServe and The WELL, cost money. They also have more conferences and more phone lines. For more information on these types of systems, check out John Dvorak's book, *Dvorak's Guide to PC Telecommunications.* ■

Copyright © 1990 by David Hawkins. All rights reserved. David Hawkins is the host of the Atari conference on The WELL (415/332-6106); send email to dhawk. He has one of the first Atari ST 1040s sold in San Francisco. Both monitors, an Okimate 20 color printer, and disks are all over the room.

Fortunately modems and cables are easy to buy and use with the ST. The main consideration is how fast a modem you want and/or need.

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w/105 MB Hard Disk (18 ms/AT-IDE)	$1,949	$2,049	$2,099	$2,174	$2,399	$2,449	$2,549
w/150 MB Hard Disk (16 ms/ESDI)	$2,499	$2,599	$2,649	$2,724	$2,949	$2,999	$3,099
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w/65 MB Hard Disk (32 ms/RLL)	$1,849	$1,949	$1,999	$2,074	$2,299	$2,349	$2,449
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w/105 MB Hard Disk (18 ms/AT-IDE)	$4,649	$4,749	$4,799	$4,874	$5,099	$5,149	$5,249
w/150 MB Hard Disk (16 ms/ESDI)	$5,199	$5,299	$5,349	$5,424	$5,649	$5,699	$5,799
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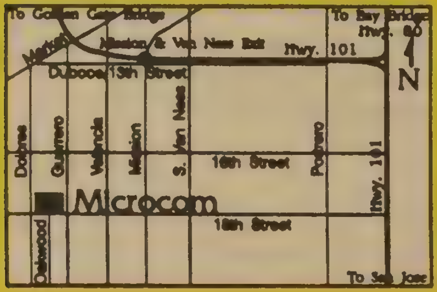

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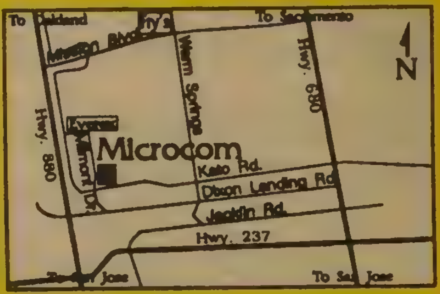

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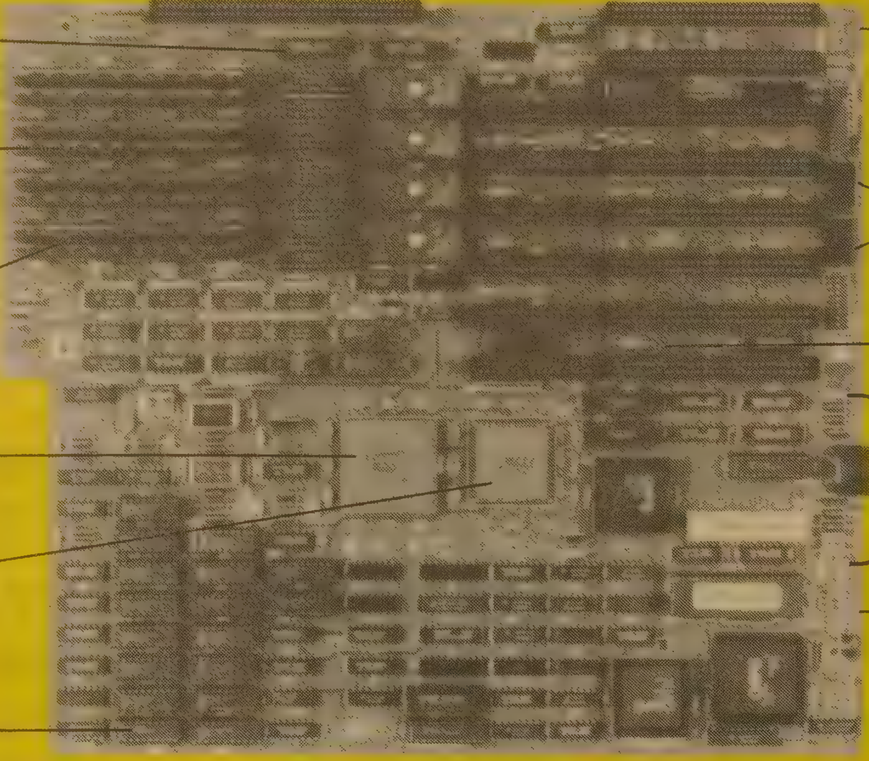

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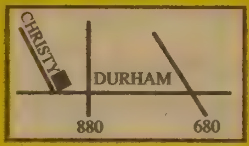

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Tales From Meetings And Conferences

BY DAVID MORGENSTERN

You can learn a lot about the world, and ruin a good education, by really *reading* marketing representatives' countless handouts. I feel that it's only good manners to take them, or at least one helping.

I pile "important" press releases, brochures, newspaper clippings, and disks in a gray bin next to my desk. When it overflows onto the floor and my feet, I read everything again, hoping to capture my original reason for keeping the things.

Since we live in a small apartment, I have to be ruthlessly selective in what I keep. But sometimes a nugget of gold washes ashore.

Back in December 1989, Apple Public Relations sent out a two-page press release covering "progress" on System 7.0. The wordy first page came out of the printer stale, although it admitted that a number of "core technologies," Layout Manager and the printer goodies, wouldn't make the first cut in a "Summer 1990 release" (dream on!). As I turned to page two, an item flew off the page, blinding me—I thought for a moment it was a moth disturbed from sleep, but instead it proved to be another example of Apple marketing double-speak.

BMUG

Under the heading "System 7.0 Hardware Requirements" was a chart with a million check boxes. It began with the following line—"As shown in the chart, System 7.0 will operate on ALL Macintosh® computers with 2Mb of RAM." (I've never understood why Apple people insist on spreading their memos and documents with a thick layer of ®, ™, and © marks, especially for names they've already used three times before. Apple Legal should smear all of Apple's trademarks in gray ink at the bottom of the letterhead next to the address.) The all-caps word "ALL" was a nice touch, even though a heavy finger on the Caps Lock key is a dead giveaway for ex-IBM employees. It's just the only way character-based computers know how to provide *emphasis,* **right?**

The chart lists Macintosh models, from 128K Classic to the then-top-of-the-line Mac IIci. They're all there, I could see, but could Apple really mean **all** Macs? People buy old 128 and 512K Macs, "for the kid," at swap meets and call BMUG to complain they can't run HyperCard.

Next to the models are the required hardware configuration for each flavor, most reading "2Mb minimum." This was a confirmation of the System 7.0 watchword of the '90s, *get more RAM.*

The required configurations for the 128K Classic, 512K Fat Mac, and 512KE Braindead models had an important caveat—"Upgrade to Mac Plus and 2Mb minimum." I guess "ALL models" really means the Mac Plus, since there's not much left of your 1984 caterpillar after it turns into 1986's butterfly. Does Apple Public Relations think that an upgraded Classic is not a Plus?

Perhaps more importantly, Apple left the required SCSI hard disk off the chart. It's almost impossible to run applications on a two-floppy system with the current operating system—forget it with System 7.0. The word from 7.0 ßetaLand suggests that unaccelerated Mac Plus users may find performance a little too slow for comfortable use. It's very likely that Apple's testers and programmers are used to working on blindingly fast Mac II-flavored machines, and have forgotten how relaxed the pace is on older models. It's not a computer, it's a stress-free lifestyle!

Copyright © 1990 by David Morgenstern. All rights reserved worldwide. David Morgenstern is a Bay Area "MacNurturer" and BMUG member. David is DMORGENSTERN on MacNET, 72030, 1607 on CompuServe, and himself at (415)549-BMUG.

BMUG MEETING NIGHTS

Things are always jumping in the weekly BMUG meetings. The news, rumors, and tips that fly around the meeting hall are always interesting—sometimes useful. Some of the "solutions" thrown out to poor, distressed users may require an advanced university degree in engineering or programming. There's plenty of incredible business during product demonstrations, too. Here's a taste:

- Have you ever noticed that when you go to the doctor's office, your symptoms disappear? The opposite is unfortunately true for vendors attempting to demonstrate their products at BMUG meetings. If there's a bug in a program, it will be revealed during the demonstration.

Over and over the representatives repeat the this-has-never-happened-before mantra. Sometimes we take pity on them and point to the unbelievably high number of INITs dwelling in the system on the Mac IIcx that we use for the meeting. Or we tell them of the times that the computer has been dropped on the floor. But sometimes a crash leads to a blood lust, a feeding frenzy, a computer lynch party looking for more bombs and programming errors.

However, some people need no help in digging their own graves. At a recent meeting, a vendor was showing an archiving INIT/cdev that adds file-compression to your Mac system. He started archiving the large multimedia files which had been loaded on the hard disk by the folks showing another product following his demonstration. I yelled out to him that it might be better to use his own files, in-

It's almost impossible to run applications on a two-floppy system with the current operating system—forget it with System 7.0. The word from 7.0 ßetaLand suggests that unaccelerated Mac Plus users may find performance a little too slow for comfortable use.

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stead of taking the chance with other people's work. Stop worrying, you mother hen, was the response—Crash! "This never happened before."

- Marketing representatives have their own special language, as does any profession. New words sometimes pop into being at meetings, and it's a particular thrill to see novel ideas given a symbolic representation for the first time.

Software and hardware publishers are always looking for *market share,* their slice of the Macintosh pie. But what do you do when you don't have a product? This happens often in the computer industry. A pre-release, or prototype, version of a product is announced, but it takes time (sometimes years) to get the thing out the door. A RasterOps salesperson described their just-released 364 color board as having "good *mind share.*" This is the number of persons that have a positive opinion of a non-product. Did they suffer from boardom while waiting for the release?

Since there were no sales or shipping figures to base this assessment, it must have been based on the number of people that stood in front of their booth at the last Macworld Expo and made whimpering noises while looking in their wallets. Perhaps the drool covering the floor was measured with a hydrometer.

- One thing that drives all BMUGers nuts is vendors who have thrown out the Apple Human Interface Guidelines and decided they know better. Small deviations are allowable with a great program and a properly apologetic attitude. A firm promise to fix the offending code in the next version will usually stop the riot.

A grammar-checking program's demonstration was moving along swimmingly, until the presenter mentioned the Command Key equivalents for buttons. "Just hit **Command-C** and you'll check the selected word." The poor guy never knew what hit him. Even PC people must learn that Cut, Copy, and Paste (**Command-X, Command-C,** and **Command-V** from the keyboard) are sacred. Fortunately he had already started a list of BMUG meeting comments for the 2.0 release, so mercy was shown.

- Our weekly computer soirée is starting to catch the public eye. *San Francisco Focus* magazine mentioned us in their yearly "Here's the Best" feature. "BMUG, otherwise known as the Berkeley MacIntosh [yes, they spelled it with a capital "I"] User's Group. This is the largest Mac-users group in the world, with a weekly open meeting that's a cross between a techie trade show and the Free Speech Movement. For some computer enthusiasts, this is better than sex."

A quick poll of the crowd showed that we would take this lying down. A couple of new members of the peanut gallery perceived this as some kind of loyalty test, swore off sexual relations forever, and became the first BMUG monks and nuns.

BYTES AND PIECES

The Apple Worldwide Developer's Conference was held in May down in San Jose. All the developers laid out a lot of money to hear speeches by bigshots and get copies of the latest development version of System 7.0. It was handed out in CD-ROM format, so we know that sales of Apple's CD player will be brisk.

Developers who requested vegetarian meals during the conference got a cute card—the conference wanted to guarantee that no carnivore would decide that the grass was greener and try to cut into the special meal line. The card was green, with a pink hand pushing an ADB plug into a broccoli floweret.

A common question on the BMUG HelpLine asks if all Mac II models can be placed on their side. The original Mac II had some heat problems when placed on its side. Most people would put the floppy drive side on the top, placing the power supply on the bottom, and that seems to be a problem.

Kensington makes a stand for the Mac II that gives a little more ventilation room. Some people have recommended pulling out the little plastic slot doors, which will really open things up; however, others think this may interfere with proper airflow patterns.

WHAT IS BMUG?

BMUG is an educational nonprofit consumer advocacy group organized to share information, and provide critical direction to users and developers in the computer community worldwide.

Like any growing organization, it is many different things to its 10,000 international membership. BMUG supports many Special Interest Groups (SIGs), an eight-line Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6-9 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG HelpLine, (415)849-HELP, and our fax number, (415)849-9026, provide technical assistance and telephonic hand-holding during business hours (11am-5:30 pm). If your question can't be answered on the spot, we try get you in touch with someone that can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around, with 400+ double-sided disks filled with the latest versions of public domain or shareware programs and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the *PD ROM™ 2.0,* our entire library and more on CD-ROM—according to Apple, it's the best selling CD-ROM!

Our BBS offers many of the latest versions of files in our software library, as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you would then be able to get in touch with us wherever you are, as well as send mail to users everywhere! BMUG is now a part of the international USENET network (apple!bmug!user.name@sun.com) or (user.name@BMUG.FIDONET.ORG). With our multi-line capability you are now able to have access to BMUG almost 24 hours a day. It's easy to use, fun, and a great resource.

To get some further information about BMUG please write to: BMUG, 1442A Walnut St. #62, Berkeley, CA 94709. If you prefer to phone our business office, call (415)549-BMUG, or Fax (415)849-9026.

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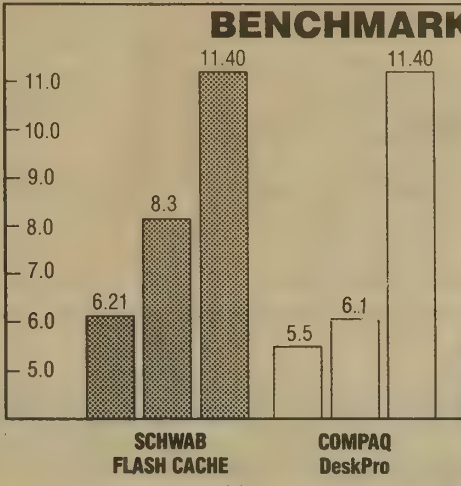

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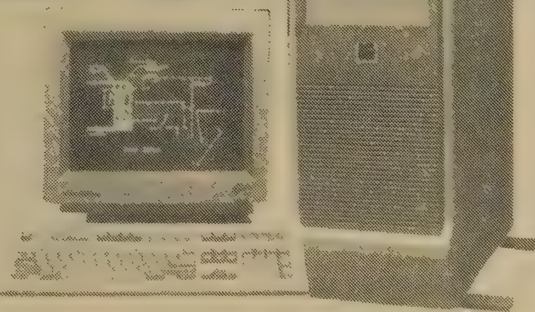

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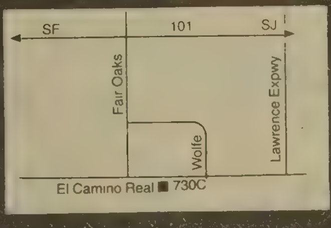

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If you do remove the shields, check back there for spiders every now and then. This is not a joke. Living insects, bugs, and spiders have found their way into the backs of open computers and have caused problems like their software cousins. Use compressed air to remove any freeloaders. The compact Mac II series (IIcx and IIci) were designed to be put on their sides.

The biggest concern with side shifting for any flavor of Mac II (it's difficult to use your SE on its side) is the hard disk drive. After backing up your hard disk, you can change the orientation of your Mac (or any computer, or hard disk). Turn the drive off until it's cold, perhaps overnight, then reformat it in the new position. The drive may wear out more quickly if this is not done, and you might lose data.

- How many times do you get to see a real, live Finder bug? Usually you see the result of a bug—Crash! But here's a System 6.0x bug that you can live through.

Take a dead disk, one that can't be initialized. Put it back in your disk drive and try to format it. When you get the

UPCOMING EVENTS:

July 12	Ashton-Tate *Full Impact*, Software Business Technology *Database Accounting Library*.
July 19	Asuka (color hand scanner), Letraset *LetraStuff*.
July 25	SF BMUG West Meeting VPL Research (virtual reality stuff).
July 26	Traveling Software *LapLink Mac III*, Outward Bound (portable Mac).
August 2	TrueVision *NuVista* (32-bit color boards), BrightStar Technologies *InterFace*.
August 9	ThunderScan (scanners), TimeSlips Corporation *TimeSlips*.
August 16	Innovative Data.
August 23	Softview i-fX (forms design).
August 29	SF BMUG West Meeting MicroSeeds Rival (Anti-Virus).
August 30	Pinnacle (optical drives).

Call the BMUG Office for information about BMUG West, our San Francisco meeting.

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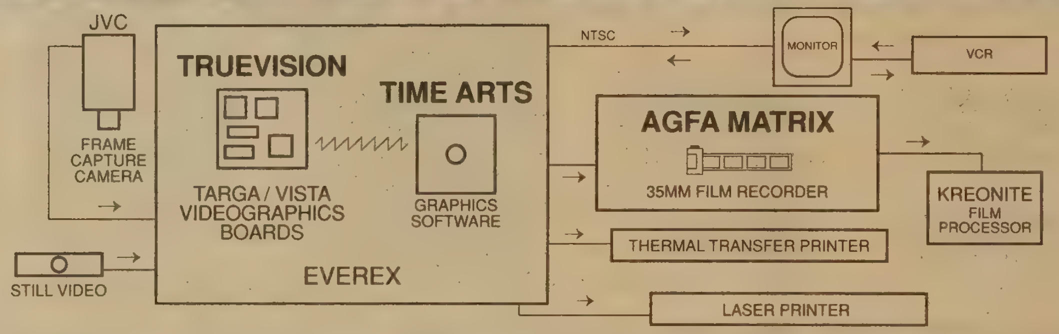

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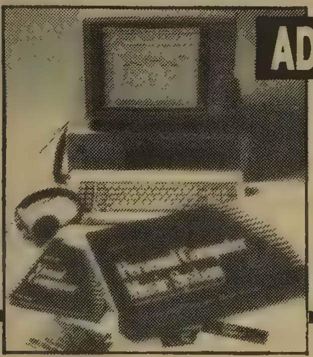

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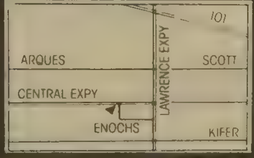

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tough luck dialog, start typing—anything but the return key. You'll see that a line of text walks across the box. Wasn't that fun?

WARNING

Several BMUG members have reported having their Macs stolen in the San Francisco Bay Area with the same modus operandi. The thief reads the want ads and finds a Macintosh for sale. He then calls the seller, asks for the price, and then the address to pick up the computer. He never shows up to purchase the machine, but a week or so later drops by your house when you're not there to steal your Mac.

Consider the following:

- Never give out your home address, or directions to your house to anyone answering an ad in the paper.
- Always get the caller's phone number and name, and call him/her right back. If the caller will not give his/her name, tell them to forget the deal.
- Try to show the computer at a neutral location—church, restaurant, or user group meeting.

SHAREWARE SPOTLIGHT

I'm continuing my campaign to destroy the working productivity of Macintosh users. Can I help it if I'm getting hooked on games? I used to be the serious computer user, with my nose to the database. No longer! I'm playing at all times of the day, even when I'm supposed to be writing, parenting, and BMUGing. But if everyone else is equally inefficient, then I'll be happy.

Mac II users should all have a copy of Solarian II (version 1.02). This program by Ben Haller, a University of California student, is a commercial-quality, arcade-style game. It has wonderful color graphics and sound. The program requires the use of two hands, three eyes, and a lot of luck. You control a little gun and shoot at a swirling array of stylized bad guys dropping bombs and worse. I showed this game off at a meeting a while ago, and fortunately didn't get destroyed in an early round. I could hold my head high at dinner.

There are still a couple of bugs in the program, but nothing fatal. Occasionally the program doesn't recognize a high score, and forgets its sounds if you quit and then return to the action. Despite the warts, this game will keep you up all night. Excellent! ■

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PC-CHECK (253)-CheckBook & savings account record keeper.
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EXPRESS CHECK (520)-Easy to use checkbook program. Prints checks too!!
REAL ESTATE ANALYST (255)-Menu driven program for mortgages, interest, amortizations, analysis between renting or owning, plus more.
PC-RECIPE (462)-Computerize your recipe box. Program will recalculate ingredients.
BARTENDER (274)-Be the hit of the party and mix the best drinks!!
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X-RATED PRINTMASTER (118)-Let your imagination take the best of you.
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X-RATED PRINTSHOP (500)-X-Rated pics for PrintShop.
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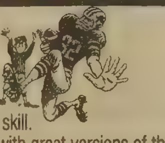
INTERSEXION V.1.01 (373)-X-Rated monopoly game with 5 levels of PLAY!! Includes trivia, jokes & more.
BAD-BAD (111)-Adult adventure game.
MAXINE (115)-Like none before!!! Sit back and watch!!

GAMES



LAS VEGAS (501)-Vegas games of skill.
PACMAN GAMES (432)-Disk filled with great versions of this classic.
STRIKER (212)-Pilot a helicopter and survive. . .Fast paced.
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#5 **HOME** Lottoman, Finance, PC-Recipe, Loans, Bartender, Aquarium & Instant Paradise, Crossword Creator, The Diet Disk, Supermusic Jukebox, Notepad.	#6 **UTILITIES** PD-Sideways, Baker's Dozen, Automaxx, Directory Scanner, Whereir, DBS-KAT, PC-File III, Disk Labels #1, Format Master, AT Utilities.

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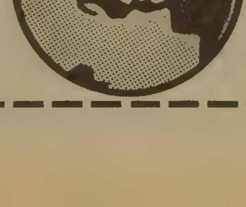

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July 9 MS DOS For CAD Level 1 Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

July 9 HyperMedia Presentation. Palo Alto. Women's Macintosh User Group. Call: (415)574-8225 or (408)735-1199.

July 9 Microsoft Word Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 9–10 Fundamentals Of UNIX Class. Berkeley. Lurnix. Call: (415)849-4478.

July 9–August 20 Desktop Publishing Comprehensive Course. San Francisco. Computer Alliance. Call: (415)771-1671.

July 10 Basics To Interactive Media Presentation. San Francisco. International Interactive Communication Society. Call: (408)866-7941.

July 10 Adobe Illustrator. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 10 Memory And Recording Storage: Future Directions Seminar. Techmart. UC Santa Cruz Extension. Call: (408)427-6600.

JULY 17–19, 1990

DATABASE WORLD CONFERENCE & EXPOSITION

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Database World Conference will present the latest developments in database technology, including SQL/object integration, client/server computing, distributed database connectivity and text retrieval. The keynote address, by Dr. George Schussel, conference chairman and founder of Digital Consulting, Inc., will discuss "The Hot Technologies & Architectures."

Tutorials and workshops are also being offered July 16–20. Contact: Digital Consulting, Inc., 6 Windsor St., Andover, MA 01810. (508)470-3880, Fax (508)470-0526.

July 10 Beyond The Men's Rules Presentation. Santa Clara. Women's Macintosh User Group. Call: (415)574-8225 or (408)735-1199.

July 10 Microsoft Excel Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 10 Lotus 1-2-3 MS-DOS Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 10 Authoring Tools For CD-1 Lecture. Palace of Fine Arts. International Interactive Communication Society. Call: (415)328-7318.

July 10–13 C Programming Hands-on Workshop. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

July 10–13 Object-Oriented Design & Programming Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

July 11 Publishing Your Newsletter On The Mac Course. San Francisco. Computer Alliance. Call: (415)771-1671.

July 11 Microsoft Word Part I Course. San Francisco. Computer Alliance. Call: (415)771-1671.

July 11 Contracting Vs. Permanent Employment Panel Discussion. Berkeley. Society For Technical Communication. Call: Marla Wilson, (415)549-3801.

July 11 Micro To Mainframe Connectivity Course. Oakland. DataNet. Call: 1-800-879-4181.

July 11 Microsoft Excel. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 11 Microsoft Excel Session 1 Course. San Francisco. Training Works. Call: (415)243-0100.

July 11 Taking Your Company Through An IPO Presentation. Oakland. High Technology Entrepreneurial Council. Call: Rachel Muñoz, (415)339-3895.

July 11–12 Intermediate UNIX Class. Berkeley. Lurnix. Call: (415)849-4478.

July 11–13 Dynamic 3-D Computer Graphic Systems For Industrial Design Conference And Exposition. Monterey. BIS CAP International. Call: Kathy Greeley, (617)893-9130.

July 12 Microsoft Word Part I Course. San Francisco. Computer Alliance. Call: (415)771-1671.

July 12 dBASE III+ Class. San Francisco. Training Works. Call: (415)243-0100.

July 12 Software Entrepreneurs' Forum IBM SIG Meeting. Santa Clara. Quantum Corp. Call: Mike Schmit, (408)244-6826.

July 12 Quark XPress Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 12 Aldus PageMaker 4.0 Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 12 Aldus PageMaker 3.0 MS-DOS Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 13 NetWare 386 OS Features Review. San Francisco. Servtel Corp. Call: (415)764-1400.

July 13 dBase III Plus Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 13 MacDraw II Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 13 Microsoft Word Part II Course. San Francisco. Computer Alliance. Call: (415)771-1671.

July 13 PC Repair Course. Oakland. DataNet. Call: 1-800-879-4181.

July 13 Advanced Quark XPress Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 14 Computer Mart. Cupertino. De Anza College. Call: (408)864-8350.

July 14 How To Build You Own XT Or AT Clone Computer For As Little As $600 Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

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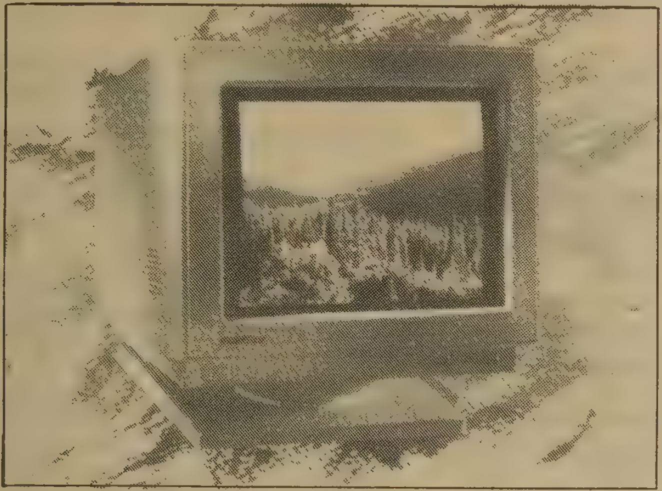

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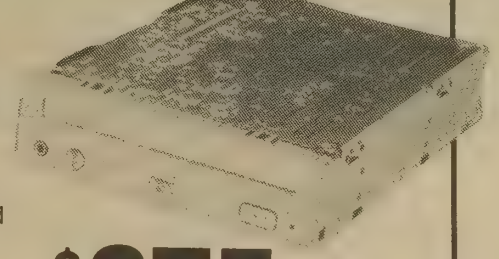

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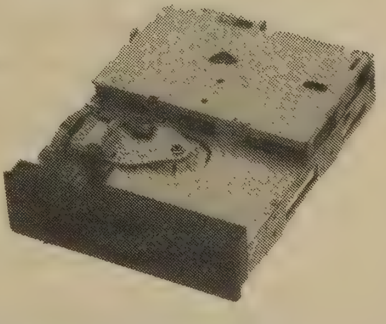

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Calendar Of Events *continued*

AUGUST 22–24, 1990

THE FIRST ANNUAL MACINTOSH SUMMIT CONFERENCE

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Join the innovators and imagineers who make outstanding contributions to the field of Macintosh computing. The Macintosh Summit Conference is designed to enhance the personal productivity and creativity of power users. It is a forum for pragmatic discussion of recent developments in areas from desktop publishing to System 7.0.

The Conference was developed jointly by Guy Kawasaki and UC Santa Barbara training specialists. Topics of sessions include System 7.0, Interactive Media, Slidemaking, Macintosh Pre-Press and Printing, and Object-Oriented Graphics. Contact: Dept. of Science, Engineering & Management, UCSB Extension, Santa Barbara, CA 93106. (805)961-4143 (839-4143 after August 1).

July 14 IBM Troubleshooting And Repair Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

July 14 NetWare 286 System Administrator Course. Oakland. DataNet. Call: 1-800-879-4181.

July 14 dBASE III+ Class. San Francisco. Training Works. Call: (415)243-0100.

July 14 WordPerfect 5.0/5.1 Session 1 Course. San Francisco. Training Works. Call: (415)243-0100.

July 14 Computer Swap. San Mateo. Computer Swap. Call: 1-800-433-7469.

July 15 Computer Show. San Francisco. Fort Mason Shows. Call: (916)725-0228.

July 16 Using X Windows. Berkeley. Lurnix. Call: 1-800-433-9338.

July 16 Aldus Freehand Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 16 Practical Perspectives On OSI Networking Seminar. Techmart. UC Santa Cruz Extension. Call: (408)562-5711.

July 16 Designing For Multimedia Presentation. Menlo Park. Women's Macintosh User Group. Call: (415)574-8225 or (408)735-1199.

July 16 Avanced Lotus 1-2-3 MS-DOS Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 16 Ventura Publisher MS-DOS Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 16 Macintosh Network Administrator Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 16–18 NetWare 286 System Manager Course. San Francisco. Servtel Corp. Call: (415)764-1400.

July 16–20 SIAM Annual Meeting. Chicago. Society for Industrial and Applied Mathematics. Call: Diana Peirce, (215)382-9800.

July 16–20 DataBase World Conference & Expo. Santa Clara. Digital Consulting, Inc. Call: (508)470-3880.

July 17 Intro To WordPerfect 5.0 Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

July 17 Introduction To Novell NetWare Seminar. Techmart. UC Santa Cruz Extension. Call: (408)562-5711.

July 17 Word Perfect MS-DOS Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 17 Introduction To Hypercard Class. San Francisco. Computer Alliance. Call: (415)771-7133.

July 17–18 X Windows Programming I Course. Berkeley. Lurnix. Call: 1-800-433-9338.

July 17–20 Computer Network Architectures & Protocols Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

July 17–20 Multivendor Networking Course. San Francisco. Integrated Computer Systems. Call: 1-800-421-8166.

July 18 IBM PC And DOS Training Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

July 18 Excel For The Macintosh Class. San Francisco. Computer Alliance. Call: (415)771-7133.

July 18 Introduction To Adobe Illustrator Class. San Francisco. Computer Alliance. Call: (415)771-7133.

July 18 Meeting With Paul Brainerd Of Aldus Corp. Palo Alto. Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219.

July 18–20 SNA Gateways—An Executive Overview Seminar. Santa Clara. J2 Software Labs. Call: (408)292-6300.

July 19 Beginning FileMaker Course. San Francisco. Computer Alliance. Call: (415)771-1671.

July 19 Taxation Of High Technology Seminar. Oakland. David Simon, CPA. Call: (415)893-5753.

July 19 dBASE IV Class. Sunnyvale. Training Works. Call: (408)287-8827.

July 19 NetWare 386 System Administrator Course. Oakland. DataNet. Call: 1-800-879-4181.

July 19 Color Studio Part 1 Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 19 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

July 19–20 X Windows Programming II Course. Berkeley. Lurnix. Call: 1-800-433-9338.

July 19–20 Sun Users Group Western Regional Conference. Sunnyvale. Sun User Group. Call: (415)336-0564 or 336-4341.

July 20 Installing NetWare 286 Course. Oakland. DataNet. Call: 1-800-879-4181.

July 20 Color Studio Part 2 Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 20 & 27 Ventura Desktop Publishing Class. San Francisco. Training Works. Call: (415)243-0100.

July 21 Computer Swap. Oakland. Computer Swap. Call: 1-800-433-7469.

July 21 Troubleshooting A Novell Network Course. Oakland. DataNet. Call: 1-800-879-4181.

July 21 WordPerfect 5.0/5.1 Session 2 Course. San Francisco. Training Works. Call: (415)243-0100.

July 21 Computer Swap. Oakland. Computer Swap. Call: 1-800-433-7469.

July 22 Computer Show & Sale. Hayward. East-West Computer Shows. Call: (415)388-8893.

July 22–August 3 Stanford Professional Publishing Course. Palo Alto. Stanford University. Call: Bill Merz, (415)725-1083.

July 23 Free Hand Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 23–24 Concepts In System Operation Class. Berkeley. Lurnix. Call: (415)849-4478.

July 23–24 NetWare v2.1 Update And Advanced Features Course. San Francisco. Servtel Corp. Call: (415)764-1400.

July 23–25 Sun Expo '90. San Jose. Sun Expo. Call: 1-800-433-1790.

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- Fuji 386-SX Mono Fileserver 4MB Memory w/80MB HD
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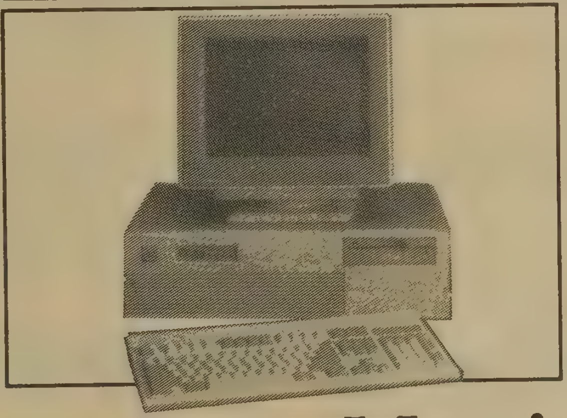

42MB Fuji 386-SX System w/1MB Memory

CPU = SX 16MHz
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LANDMARK = 20.6
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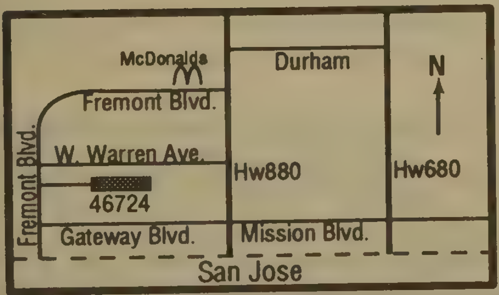

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Calendar Of Events *continued*

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July 24 Automating Your Business Systems On The Macintosh Seminar. San Francisco. J.C. Lukrich & Co., CPA. Call: Suzette, (415)864-6770.

July 24 Lotus 1-2-3 Macros Class. Sunnyvale. Training Works. Call: (408)287-8827.

July 24 Hypercard II Class. San Francisco. Computer Alliance. Call: (415)771-7133.

July 24–27 System Engineering Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

July 24–27 Knowledge-based Systems & Artificial Intelligence Course. San Francisco. Integrated Computer Systems. Call: 1-800-421–8166.

July 25 PageMaker Part I Course. San Francisco. Computer Alliance. Call: (415)771-1671.

July 25 Mathematica: A Tool For Problem Solving Seminar. Techmart. UC Santa Cruz Extension. Call: (408)562-5711.

July 25 Aldus Persuasion Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 25–26 Designing Object-Oriented Software: An Introduction Class. Santa Clara. Instantiations, Inc. Call: (503)242-0725.

July 26 FileMaker Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 26 PageMaker Part II Course. San Francisco. Computer Alliance. Call: (415)771-1671.

July 26 How To Be A Computer Entrepreneur Seminar. San Francisco. Learning Annex. Call: (415)922-9900.

July 27 Using Lotus 1-2-3 Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

July 27 NetWare 286 System Administrator Course. Oakland. DataNet. Call: 1-800-879-4181.

July 27 Intro To The Mac Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 27–29 The American Association Of Artificial Intelligence 1990 Spring Symposium. Palo Alto. Computer-using Educators. Call: Beverly Woolf, (413)549-6036.

July 20–22 CAD For Supervisors Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

July 28 Building A PC Clone From Scratch Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

July 28 PC Repair Course. Oakland. DataNet. Call: 1-800-879-4181.

July 28 Desktop Publishing & Laser Printers Technical Forum. San Jose. JDR Microdevices. Call: (408)947-8881.

July 30 Hypercard Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 30–31 R:Base Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

July 30–31 Pixel Paint Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

July 30–August 2 Introductory C Programming. Berkeley. Lurnix. Call: 1-800-433-9338.

July 31 Microcomputer Expo. San Francisco. Government Technology Services, Inc. Call: (213)320-3320.

July 31 Letraset Color Seminar. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

AUGUST

August 1 Aldus PageMaker 4.0 Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 1 Aldus PageMaker 3.0 MS-DOS Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 2 Intro To MS-DOS Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 2 PageMaker Part II Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 3 Microsoft Works MS-DOS Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 4 Computers At Home: For Your Own Business Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

August 4 WordPerfect 5.0/5.1 Session 3 Course. San Francisco. Training Works. Call: (415)243-0100.

August 4 IBM PC Clone Troubleshooting And Repair Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

August 5 Auditory Illusions Presentation. San Francisco. MuSIG. Call: Glenn Spencer, (415)858-1493.

August 6 Microsoft Word for Windows Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 7–10 Network Planning Support & Management Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

August 8 Microsoft Word Part I Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 8 dBASE III+ Class. San Francisco. Training Works. Call: (415)243-0100.

August 9 PageMaker, Part I Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 9 Microsoft Word Part I Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 9 Automating Your Business Accounting System On A Macintosh Seminar. San Francisco. J.C. Lukrich & Co. Call: Suzette, (415)864-6770.

August 9 Microsoft Excel Session 2 Course. San Francisco. Training Works. Call: (415)243-0100.

August 9–10 Enhanced Information Services Conference And Expo. San Francisco. Virgo Publishing, Inc. Call: (602)483-1247.

August 9–12 AutoLISP Level I Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

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1 Meg Simms	65

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Clearvue II/GS system (19" mono) for II/SE	1469
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Mac II Color 16" system (708x1650)	2599
Color 208 Board 8 bit color card	379
Color 364 Board 24 bit live color card	1375
Color 264 Board 24 bit color card	599
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IBM PROPRINTER III	399
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QUME/C-I TOH	CALL
STAR/BROTHER	CALL
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TOSHIBA T3200	489
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286N-12	799
386S-16-40MB	1299
386C-20	1379
9 PIN PRINTER (NARROW/WIDE)	139/239
18 PIN PRINTER (NARROW/WIDE)	249/349
VGA COLOR MONITOR	339
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486

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- Desktop Case
- Built-in Real Time Clock

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- Desktop Case
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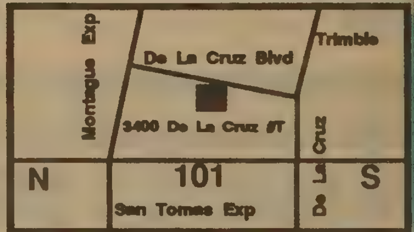

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-HM4319D, 19", VGA to 1280X1024N	2099
-HM4119DDL, 19", 1024X768N	2199
-HM4119DAA, 19", 1280X1024N	2299
NEC	
-NEC 4D, 16" VGA to 1024X768N	1199
-NEC 5D, 19" VGA to 1280X1024N	2199
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-Model 830 Flatbed Scanner	1995
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-Page Scanner with 16 grey	665
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-MSF-300ZPC	1985
-MSF-400GS	2995

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Plotter

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-1025, A-E, 8 Pen	4899
-1044GT/DM, A-E	8995
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-DMP62, A-E	3999
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ROLAND	
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-DXY1200, A&B	1499

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-SummaSketch II Pro 12X18 w/Cur. & Stylus	639
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-12X17, Cur. & Stylus	649
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-PUMA Pro, 12X17 4 buttons & Stylus	689
CALCOMP	
-12X12, 4 or 16 buttons	389
-12X18, 4 or 16 buttons	699
-18X24, 4 or 16 buttons	1799
-24X36	3599
-36X48	3999

Calendar Of Events *continued*

August 11 Computer Mart. Cupertino. De Anza College. Call: (408)864-8350.

August 11 Shop Till Ya Drop Computer Swap. Alameda. Computer Swap. Call: 1-800-433-7469.

August 11 Computer Show & Sale. Marin. East-West Computer Shows. Call: (415)388-8893.

August 11 WordPerfect 5.0/5.1 Session 1 Course. San Francisco. Training Works. Call: (415)243-0100.

August 11 Computer Swap. Alameda. Computer Swap. Call: 1-800-433-7469.

August 10 Microsoft Word Part II Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 12 Computer Show & Sale. Santa Rosa. East-West Computer Shows. Call: (415)388-8893.

August 13 How To Build Your Own CAD System Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

July 13–16 NetWare Support & Service Course. San Francisco. Servtel Corp. Call: (415)764-1400.

August 14 Language Learning Environments Presentation. Cupertino. IICS. Call: (408)866-7941.

August 14–17 Local Area Networks: Implementation & Configuration Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421–8166.

August 15 Intro To Adobe Illustrator Class. San Francisco. Computer Alliance. Call: (415)771-7133.

August 15 Aldus Persuasion Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 16 Aldus Freehand Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 16 Beginning FileMaker Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 16 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

August 17 Word Perfect Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 18 Computer Show & Sale. Vallejo. East-West Computer Shows. Call: (415)388-8893.

August 18 Shop Till Ya Drop Computer Swap. Oakland. Computer Swap. Call: 1-800-433-7469.

August 18 Excel For The Macintosh Class. San Francisco. Computer Alliance. Call: (415)771-7133.

August 18 Building A PC Clone From Scratch Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

August 18 Computer Swap. Oakland. Computer Swap. Call: 1-800-433-7469.

August 19 Computer Show & Sale. Sacramento. East-West Computer Shows. Call: (415)388-8893.

August 19 Computer Show. San Francisco. Fort Mason Shows. Call: (916)725-0228.

August 20–22 3D Features/Release 10 Level III Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

August 20–24 SCO Forum 90: The International SCO Technology And Marketing Conference. Santa Cruz. SCO. Call: 1-800-726-8649.

August 21 Intro To Hypercard Class. San Francisco. Computer Alliance. Call: (415)771-7133.

August 21–24 Hands-on PC Configuration And Troubleshooting Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421–8166.

August 21–24 Hands–on Datacomm Troubleshooting Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

August 21–24 Software Project Management Tools & Techniques Course. San Francisco. Integrated Computer Systems. Call: 1-800-421-8166.

August 22 Automating Your Business Accounting System On A Macintosh Seminar. San Francisco. J.C. Lukrich & Co. Call: Suzette, (415)864-6770.

August 22 Hypercard Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 22 PageMaker Part I Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 22–24 First Annual Macintosh Summit Conference. Santa Barbara. UC Extension. Call: (805)961-4143.

August 23 PageMaker Part II Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 23 Microsoft Word Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 24 Intro To Macintosh Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 25 Intro To Graphics Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 25 POST Code QA Plus Technical Forum. San Jose. JDR Microdevices. Call: (408)947-8881.

August 25 IBM PC Clone Troubleshooting And Repair Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

August 25 Computer Swap. San Francisco. Computer Swap. Call: 1-800-433-7469.

August 26 Computer Show & Sale. Hayward. East-West Computer Shows. Call: (415)388-8893.

August 27 Microsoft Windows 3.0 Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 27–29 Animator Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

August 28 Hypercard II Class. San Francisco. Computer Alliance. Call: (415)771-7133.

August 28 Advanced Excel Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 28–31 Object-Oriented Design & Programming Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

SEPTEMBER

September 8 Computer Mart. Cupertino. De Anza College. Call: (408)864-8581.

September 8 Building A PC Clone From Scratch Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

September 8 Computer Swap. Santa Clara. Computer Swap. Call: 1-800-433-7469.

September 9 Swap Meet. San Francisco. Apple Core. Call: (415)771-5830.

September 9 Computer Show & Sale. Hayward. East-West Computer Shows. Call: (415)388-8893.

September 9 MiBAC, Software For Jazz Improvisation Demonstration. Palo Alto. MuSIG. Call: Glenn Spencer, (415)858-1493.

September 9–12 Open Systems Applications Development Conference. San Jose. Unify Corp. Call: 1-800-247-0262.

September 10–13 NetWorld '90 Expo. Dallas. H.A. Bruno, Inc. Call: 1-800-444-3976.

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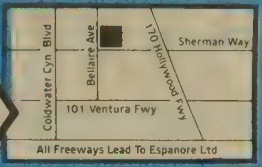

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4"x15/16"	2000	2 Across	4143	11.40
4"x1 7/16"	1000		4146	8.50
4"x1 7/16"	5000		7014	22.40
2¾"x2¾"	250	3.5" Disks	4241	12.95
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3½"x6"	500	Post Card	4167	12.35
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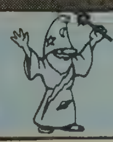
Sony QD2000	14.95
3M — DC2000	15.95
3M - DC2120 (Ex)	19.95
Verb ST-600	9.95
Maxell CS 600	17.95

WIZARDWARE (Pak) $34.95



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Calendar Of Events *continued*

September 11 Business And Point Of Sale Presentation. San Francisco. IICS. Call: (408)866-7941.

September 11–12 SQL Proficiency Seminar. Santa Clara. Database Programming & Design. Call: Lynne Mariani, (415)995-2471.

September 11–14 Distributed Databases: Design, Implementation & Management Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421–8166.

September 14–19 AppleFest/ComputerFest '90 West. San Francisco. Exposition Management, Inc. Call: 1-800-262-FEST.

September 15 Computer Show & Sale. Vallejo. East-West Computer Shows. Call: (415)388-8893.

September 15 IBM PC Clone Troubleshooting And Repair Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

September 15–18 First International Multimedia Conference. New York. MultiMedia Computing Corp. Call: 1-800-248-5474.

September 18–21 CASE: Computer-Aided Software Engineering Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421–8166.

September 18–21 Image Processing & Machine Vision Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

September 18–21 Project Management: Skills For Success Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

September 20 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

September 22 Computer Show & Sale. Oakland. East-West Computer Shows. Call: (415)388-8893.

September 23 Computer Show. San Francisco. Fort Mason Shows. Call: (916)725-0228.

September 23 Computer Show & Sale. Santa Rosa. East-West Computer Shows. Call: (415)388-8893.

September 25–27 PC Expo. Chicago. H.A. Bruno, Inc. Call: 1-800-444-3976.

September 25–28 C Advanced Programming & Data Structures Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

September 25–28 Multivendor Networking Course. San Francisco. Integrated Computer Systems. Call: 1-800-421-8166.

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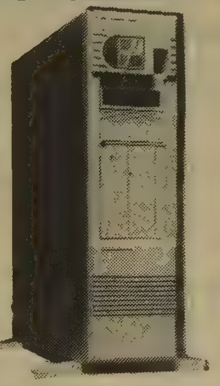

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Valley Computer Club (VCC). Meetings: 1st Wed., Turlock Jr. High School. C64/C128 Amiga and Commodore MS-DOS users group. Call: (209)529-8473 or 668-8636. [Exp. #75.]

APL

APL Bay Area Users Group. Meetings: 2nd Mon., 7:00 pm, variable. Call: Tibor Horvath, (415)283-5611. [Exp. #75.]

APPLE

ABUG—Apple Blossom User Group. Meetings: Apple II Group 1st Wed., Mac Group 3rd Wed. Write for info: P.O. Box 53323, San Jose, 95123. Call: (408)395-7900. [Exp. # 74.]

Apple II SIG. Meetings: 4th Thurs., 7:30 pm, Lynbrook High, 1280 Johnson Ave. (W. San Jose). Call: Fred Bernal, (408)258-0284. [Exp. #74.]

Apple IIGS SIG. Meetings: 3rd Tues., 7:00 pm, Wilcox High, 3250 Monroe St., Santa Clara. Call: Dave Cone, (415)322-7867. [Exp. #74.]

Apple SAC—Apple II. Meetings: 1st Wed. and 3rd Tues. Call: (916)991-7313. [Exp. #75.]

Appleworks SIG. Meetings: 4th Tues., 7:00 pm, Wilcox High, 3250 Monroe St., Santa Clara. Call: Egon Jensen, (408)356-2660. [Exp. #74.]

San Francisco State Univ. Apple Core. Meetings: 2nd Tues., 7:00 pm, Hensill Hall, Rm. 205. An Apple II user group. BBSes, newsletter, demos, mentoring, swaps, DTP and telecom sub groups. Call: (415)771-5830. [Exp. #75.]

Tri Valley Apple II User Group. Meetings: 1st Thurs., 6:30 pm. Call: Dan Balsey, (415)828-6237 for meeting location. [Exp. #73.]

AT&T UNIX

AT&T UNIX Users Group-North Bay. Meetings: 1st Wed., 6:00 pm, San Francisco AT&T Bldg., 50 Fremont St.

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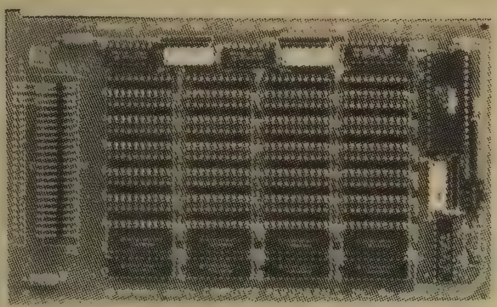

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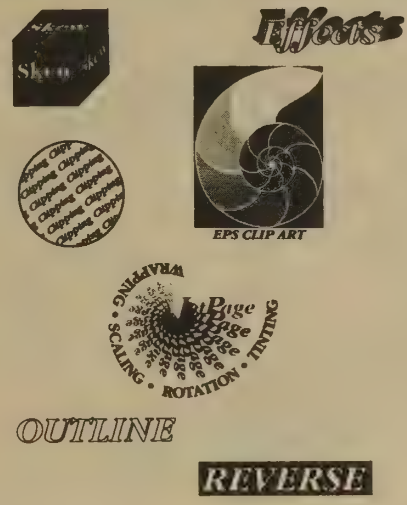

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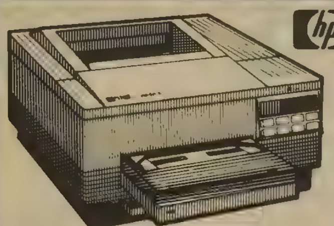

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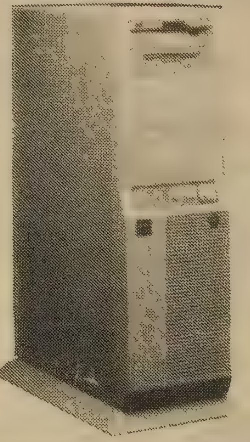

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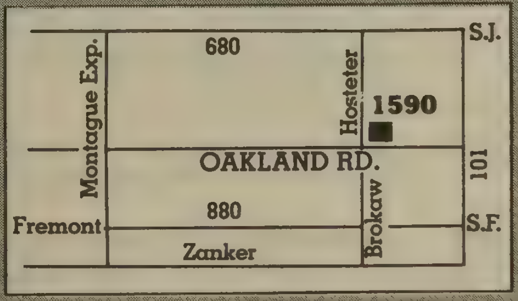

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AT&T UNIX Users Group-South Bay. Meetings: 4th Wed., 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100 or USNET: the.cup.portal.com. PM new user education. [Exp. #73.]

AT&T UNIX Users Group-Tri-Valley. Meetings: 3rd Thurs., 6:30 pm, Pleasanton AT&T Visitors Center, 4400 Rosewood Dr. Call: Ed Novi, (415)225-2996. PM new user education. [Exp. #73.]

COAST (CA Original Atari ST User Group). Meetings: 3rd Wed., 6:30 pm, Berkeley Conference Center, 2105 Bancroft Way. Call: (415)945-1949. [Exp. #75.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Community Library. Call: Keith Simmons, (415)887-2008. [Exp. #75.]

ATARI

ABACUS (Atari Bay Area Users Society). Meetings: 1st Sat. Call for place/time, (415)753-8483. [Exp. #74.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Community Library. Call: Keith Simmons, (415)887-2008. [Exp. #75.]

ST-ACE (Atari Computer Enthusiasts). Meetings: 3rd Thurs., 7:00 pm, Baptist Church on Sebastepol Rd., Santa Rosa. Call: Hal Andersen, (707)542-1745. [Exp. #73.]

AUTOCAD

AutoCAD DCA Engineering Software Users Group. Meetings: 3rd Wed. Call for location. Call: Mike Foley, (415)734-0707. [Exp. #73.]

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SF Bay Area C.A.S.E. Users Group. Meetings: Once per quarter. Call: David Plotkin, (415)842-6706. [Exp. #75.]

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COMMODORE

Cupertino Chapter Of 64/More Commodore User Group. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. [Exp. #75.]

CWEST Bay Area Commodore Users Group. Meetings: 3rd Wed., 7:00 pm, H. Hoover Mid School. Call: (415)626-9946; BBS: (415)431-4829. [Exp. #73.]

CWEST—Commodore 64/128. Call: (415)626-9946. [Exp. #75.]

Fairfield Commodore User Group. Meeting: 1st and 3rd Mon., 7:30 pm, Solano County Board of Education Bldg., Texat St., Fairfield. Amiga, Commodore 64, 128, PC-40-III. Call: (707)427-6805 or Newsshop BBS (707)446-7235. [Exp. #75.]

North Valley Chapter Of 64/More Commodore User Group. Meetings: 2nd Sat., 10:00 am, Milpitas Library. Call: (408)262-9334. [Exp. #75.]

San Jose Chapter Of 64/More Commodore User Group. Meetings: 1st Sun., 6:00 pm, Mercury Savings on Blossom Hill. Call: (408)262-9334.

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dBASE

Clipper SIG. Meetings: 3rd Tues., 8:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: J.R. Whiple, (408)243-2796. [Exp. #73.]

Database Design SIG. Meetings: 3rd Tues., 7:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Mark Gerow, (408)326-3364. [Exp. #73.]

DataEase User Group. Meetings: 4th Thurs., 3:30 pm, 101 Montgomery St. Call: (415)945-7817. [Exp. #75.]

dBASE IV SIG. Meetings: 1st Tues., 7:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Fletcher Johnson, (408)283-1333. [Exp. #73.]

dBXL/Quicksilver SIG. Meetings: 3rd Tues., 8:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Karl Snyder, (408)846-1814. [Exp. #73.]

FoxBase/FoxPRO SIG. Meetings: 3rd Tues., 8:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Mark Scaramella, (408)288-8423. [Exp. #73.]

Silicon Valley dBASE Language Group. Meetings: 2nd Tues., 6:30 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. A nonprofit volunteer organization dedicated to the education and development of database users and professionals. Call: Michael Masterson, (408)972-4889. [Exp. #73.]

Ventura SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: (415)391-1333. [Exp. #73.]

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EAGLE

Eagle Computer Users Group. Meetings: 2nd. Sat., 9:00-12 noon, Tandem Computer, 10435 N. Tantau Ave., Cupertino. Call: (408)972-1965. [Exp. #73.]

EPSON

Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #73.]

FOCUS

NC FUSE—Northern California FOCUS Users. Meetings: quarterly. P.O. Box 61325, Sunnyvale, CA 94088-1325. Sharing FOCUS knowledge and experience. [Exp. #73.]

GENEALOGY

Family Roots Genealogy Program User Group. Meetings: Jan, March, May, July, Sept, & Nov. For info: Joseph L. Rick, 135 Leslie Dr., San Carlos, CA 94070-3459. Include SASE. [Exp. #74.]

IBM AND COMPATIBLES

Basic SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)952-3450. [Exp. #75.]

Beginners SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)211-9166. [Exp. #75.]

Columbia SIG/SFPCUG. Meetings: 3rd. Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)566-0587. [Exp. #75.]

Desktop Publishing SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: (415)391-1333. [Exp. #75.]

EastBay FOG. Meetings: 3rd Wed. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #75.]

Investment Software Association, a SIG of San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm, Donatello Hotel at Post and Mason. Call: (415)788-5388. [Exp. #75.]

Lotus SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)282-4100. [Exp. #75.]

MS Word SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)929-1993. [Exp. #75.]

Napa Valley PC Users Group. Meetings: 2nd Wed., 7:30 pm, Buck's lower plaza, 10 Chapel Hill Dr. Call: Bob Kulas, (707)255-9241. [Exp. #73.]

New Users SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)457-0729. [Exp. #75.]

P.I.E. IBM And Compatibles SIG. Meetings: 3rd Wed., 7:30 pm, General Disk Corp., 1530 Montague Expwy. Call: Clay Walker, (408)736-7704. [Exp. # 74.]

PC Clone Users Group. Meetings: 2nd Mon., 7:00 pm, Fort Mason Center, Bldg. E, Rm. 287. BBS: (415)621-8425. Call: (415)861-9321. [Exp. #73.]

PC Professionals SIG/SFPCUG. Meetings: 2nd Thurs., 6:15 pm, Call: Kendall Callas, (415)821-1310. [Exp. #75.]

Peninsula Computer Club—"Kay-Fun." Meetings: 2nd Thurs., 7:30 pm, Social Room, Lauren St., San Carlos. CP/M and DOS libraries. Call: BBS: (415)571-9259. Voice: 593-9981. [Exp. #73.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm, Donatello Hotel at Post and Mason. Call: (415)788-5388. [Exp. #75.]

San Francisco Computer Society. Meetings: 1st Mon., 1350 7th Ave., San Francisco. Call: (415)929-0250. [Exp. # 74.]

San Francisco PC Users Group. Meetings: 3rd Mon., 3145 Geary Blvd., Ste. 155, San Francisco. Call: (415)221-9166. [Exp. #73.]

Smalltalk/V User Group. Meetings: Last Thurs., 6:30 pm. Call: David Freihofner, (415)362-4283. [Exp. #75.]

Teachers SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)982-4221. [Exp. #75.]

TRS Nybblers. Meetings: 2nd Fri., 8:00 pm, Chabot College, Bldg 1560. MS-DOS, UNIX, OS-9, CP/M. BBS (415)352-8442. Call: Ken Bailey, (415)462-4442. [Exp. #74.]

WordPerfect SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)821-1310. [Exp. #73.]

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MACINTOSH

AHUG—Apple Hypercard Users Group. Meetings: 1st Fri., 7:00 pm, Cupertino. Guest speakers & stack downloading. Call: (408)974-1707 [Exp. # 74.]

MacDiablo Macintosh Users Group (MDUG). Meetings: 4th Wed., 7:30 pm, Community Rm., Glendale Federal Bank, 3001 Crow Canyon Rd., San Ramon. Call: Harvey Scudder, (415)828-4995, Rym Maggiora, 829-5501. [Exp. #73.]

Macintosh Application Group. Meetings: TBA. Call: (415)751-9185. Main focus is application support for the user and language programming, all levels. Newsletter is in the making. [Exp. #73.]

MacSEF. Meetings: 3rd Tues., 7:00 pm, Call: Tony Meadow, (415)644-9400. [Exp. #75.]

North Coast Mac Users Group. Meetings: 3rd Wed., 7:30 pm, Sonoma State University, Darwin Hall, Rm. 108. Not a student organization, annual dues for individuals and businesses. Call: Reed Hopkins, (707)542-1089. [Exp. #74.]

P.I.E. Macintosh SIG. Meetings: 2nd Thurs., 7:00 pm, Institute of Computer Technology, 1196 Lime Dr., Sunnyvale. Call: John Alston, (408)735-8247. [Exp. #74.]

Peninsula Apple/Macintosh Users Group. Meetings: 3rd Thurs., Ampex cafeteria, Redwood City. Call: Les Dyer, (415)591-2124. [Exp. #75.]

MULTIMEDIA

The International Interactive Society—IICS. Meetings: 2nd Tues., 7:00 pm, UCSF Laurel Heights Conference Center. Call: (415)328-7318. [Exp. #75.]

MUSIC

MuSIG. Meetings: 1st Sun., 2:00 pm. Various locations. Call: (415)858-1493. [Exp. #75.]

NETWARE

Central Valley NetWare User Group. Meetings: To be determined. Call: Rick Utley, (209)825-7063. [Exp. #75.]

ORACLE

San Francisco Oracle User Group. Meetings: 2nd Wed., Various locations. Call: (415)894-4549. [Exp. #73.]

PARADOX

San Francisco Paradox User Group: BAPALS. Meetings: 4th Tues., 4:00 pm, SF State Downtown Center, 814 Mission St., Suite 206. Call: Brad Jung, (415)287-5833. [Exp. #75.]

PROGRAMMING LANGUAGES

Basic SIG/SFPCUG. Meetings: 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)952-3450. [Exp. #75.]

Fourth Interest Group Of North Bay. Meetings: 3rd Sat., 1-5 pm, 2055 Center St., Berkeley. Tutorial at noon. Call: Leonard Morgenstern, (415)376-5241. [Exp. #73.]

R:BASE

East Bay R:Base User Group. Meetings: 4th Thurs., 8:30 am, Call: David, (415)548-4927. [Exp. #75.]

Peninsula R:Base User Group (PR:BUG). Meetings: 2 Meadowsweet Lane, San Carlos. Call: (415)592-5033. [Exp. #73.]

SQL

SQL Server User Group. New, call for information. Call: Patty Sellers at Marathon Systems, (415)362-0500. [Exp. #75.]

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Texas Instruments Professional Computer Users Group. Meetings: 4th Thurs., Magnolia Inn, 176 S. Bernardo, Sunnyvale. Call: Thor, (415)386-5237, or Steve, (415)968-9543. [Exp. #76.]

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Ventura SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: (415)391-1333. [Exp. #75.]

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Independent Computer Consultants Association. Meetings: 3rd Wed., 6:00 pm. Meetings are open to non-members and members. Call: ICCA, (415)441-2948. [Exp. #75.]

Rracsa, For Sysops & Users. Meetings: 2nd Tues., 6:30 pm, CoCo's Restaurant, 1305 S. Mary, Sunnyvale. Call: Irv Hoff, (415) 948-2166. [Exp #73.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #75.]

United Sysops Association (U.S.A.). Meetings: 2nd Wed., 7:00 pm, call for location. SIG for BBS sysops and users. Call: Bill Strouse, (415)453-3321. [Exp. #75].

Women's Computer Society. Call: Tanya Halepota, (415)949-3936. [Exp. #75.]

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continued from page 40

the 30 to 40 tps range. SQL Server running on a Compaq 386/33 PC performed at 8 to 12 tps, slightly better than the 5 to 10 tps performance of Sybase on a MicroVAX II, a low-end VAX minicomputer. This last result gives some credibility to the claim that PC local area networks have become a viable alternative to minicomputers for data processing applications.

All indications point to a continuing escalation of the benchmark wars over the next few years. Computer systems with multiple processors, tightly coupled servers, improvements in database caching techniques and other trends will continue to push the performance claims of the DBMS vendors higher. For example, Oracle has already claimed performance of up to a thousand transactions per second on an NCUBE, a massively parallel system that links up to 8192 processors in parallel.

In an attempt to bring more stability and meaning to the benchmark data, several vendors and database consultants have banded together to produce a standard relational database benchmark that would allow meaningful comparisons among various

INFORMIX SOFTWARE, INC.

Informix Software is a leading vendor of UNIX-based relational DBMS systems. The company's first relational DBMS, Informix, was implemented on UNIX-based microcomputer systems in the early 1980s, and was known for its efficiency and compactness compared to the VAX/VMS-based DBMS systems that were introduced about the same time.

In 1985 Informix was rewritten as a SQL-based DBMS and introduced as Informix-SQL. Informix-SQL has since been ported to several dozen different UNIX-based systems, ranging from UNIX-based PCs to Amdahl mainframes running UNIX. Informix has also been ported to personal computers under MS-DOS and to Digital's VMS operating system, but the majority of the company's sales remain in the UNIX market.

In addition to the Informix DBMS engine itself, the company offers Informix-4GL, a SQL-based fourth generation language that supports the development of forms-based interactive applications. The ACE report writer, another part of the Informix product line, supports the creation of different types of reports without programming. The programmatic interface to Informix-SQL is via embedded SQL, and a variety of host programming languages are supported. Informix-Turbo is a high-performance version of the Informix database engine, positioned to compete with OLTP versions of other vendors' DBMS products.

In 1988 Informix merged with Innovative Software, and added a line of PC-based office automation software to its product line. More recently, the company has shipped Wingz, a graphical spreadsheet for the Macintosh, with a future version of Wingz promised for IBM PCs under OS/2 as well. With these products, Informix is positioning itself as a full-line vendor of office automation products, all built on the underlying Informix database. To better support office automation applications, the company has announced its intention to add support for documents and other large objects to Informix. Informix Corporation's annual sales are currently in the $100 million range.

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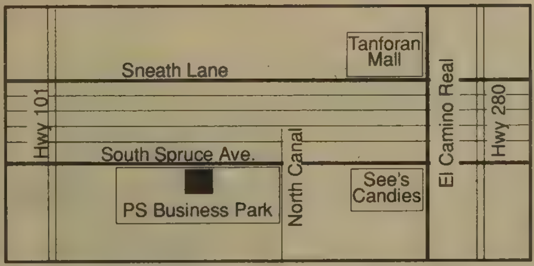

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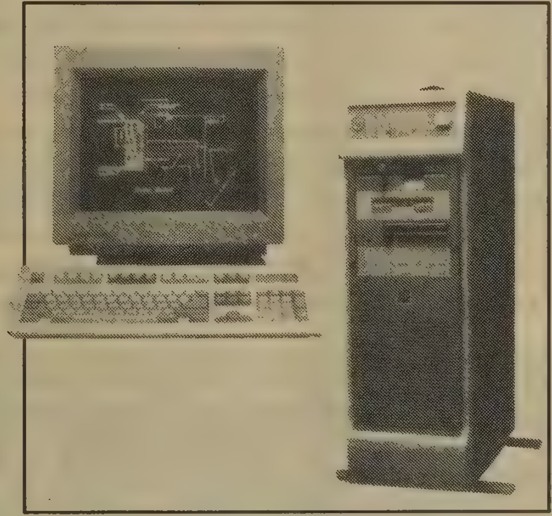

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DBMS products. To date, however, this group has had little real impact on database benchmarking.

Another phenomenon currently on the rise is the use of independent database consultants to "validate" benchmark data, providing an aura of independence and respectability to DBMS vendor claims. Unfortunately, the DBMS vendor usually pays the database consultant for this service, and many of the consultants earn substantial fees by consulting for the DBMS vendors, creating a built-in conflict of interest.

Despite vendor claims about OLTP performance, there are lingering doubts about the suitability of SQL for high-volume transaction processing applications. The best advice for prospective buyers of a SQL-based DBMS is to be skeptical of vendor benchmark claims and to ask questions about how the benchmark was performed, on what kind of hardware, and by whom. For real information about how a DBMS will perform in your application, the best data can be obtained by prototyping the application and benchmarking it on your own data. A discussion with another user who has implemented an appli-

INGRES CORPORATION

Ingres Corporation had its origins in the Ingres relational database prototype built at the University of California at Berkeley. During the early and middle 1980s, the Ingres DBMS and its QUEL database language were a major rival to SQL, and there was a particularly strong competitive rivalry between Ingres and Oracle in the midrange DBMS market. When SQL emerged as the standard database language, the company converted Ingres into a SQL-based DBMS. The product thus enjoys some of the advantages of being a more recent SQL implementation, along with the benefits of more than a decade of relational database experience.

Ingres was first implemented on Digital minicomputers, and the majority of the company's sales still come from the VAX hardware platform. Ingres has also been ported to several dozen different UNIX-based systems, and Ingres for PCs runs on DOS-based personal computers. A version of Ingres has also been introduced for IBM mainframes running VM/CMS. Using Ingres/Star, an Ingres installation on one system can remotely access Ingres databases on another system where Ingres is installed.

With its academic origins, Ingres has always had a reputation as a technology leader in the DBMS market. For example, its distributed database offerings have typically been available earlier, and with more comprehensive features, than those of its competitors. In the PC arena, the company squeezed its implementation of Ingres for PCs into a standard 640KB MS-DOS system, unlike the extended memory systems required by some of its competitors.

The company's business and development activity currently appears to be focused on two areas:

•Database engines, where the company is again trying to "lead the pack" in technology by adding object-oriented extensions and knowledge-based systems features to its SQL-based DBMS.

•Database tools, which are used as front-ends to the Ingres DBMS and have been licensed to others. The Ingres tools have been licensed to Digital for use as front-ends to Digital's own Rdb/VMS relational DBMS for VAX/VMS systems. Annual sales of Ingres are currently in the $100 million range.

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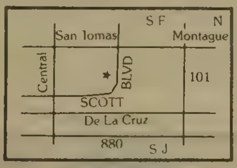

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cation similar to yours using the proposed DBMS can also provide useful information.

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With the unveiling of its SAA strategy, IBM showed that it considers a relational database to be a strategic product that is logically an extension of a computer's operating system. The IBM product offerings support this point of view. DB2 operates as a subsystem of the MVS operating system on IBM mainframes, and the OS/400 operating system for the AS/400 midrange systems includes an integrated relational DBMS. With OS/2, IBM made the point even more explicit by combining a relational DBMS with key communications functions and calling the result OS/2 Extended Edition.

Other computer system vendors, independently and in response to IBM, have also concluded that relational databases are a strategic technology, and they now offer vendor-proprietary DBMS products for their systems:

•Digital Equipment Corporation has poured millions of dollars into the development of Rdb/VMS and VAX SQL, its relational DBMS products for the VAX/VMS family of systems.

•Hewlett-Packard has invested heavily in Allbase, a hybrid DBMS which supports HPSQL, a relational interface, and also provides backward compatibility with Image, a popular HP DBMS based on the network data model.

•Tandem has developed NonStop SQL, a

MICROSOFT CORPORATION

Microsoft is the largest vendor of personal computer software in the world, with annual revenues approaching one billion dollars. As the developer of MS-DOS, Microsoft Windows, and OS/2, the company is the leading supplier of personal computer systems software. It is also a major supplier of PC applications software, with a full line of products that include spreadsheets, word processors, graphics packages, project management programs, and computer languages (C, Pascal, BASIC, Assembler). Microsoft is also the largest supplier of applications software for Apple Computer's Macintosh personal computer.

Until 1987, Microsoft's product lineup did not include a database management system. With the announcement of OS/2 Extended Edition in 1987, IBM effectively extended its definition of a personal computer operating system to include an integrated DBMS and data communications. In 1988, Microsoft responded with SQL Server, a version of the Sybase DBMS ported to OS/2. Microsoft markets SQL Server as its OS/2 DBMS solution for its OEM customers, and Ashton-Tate has responsibility for retail distribution of SQL Server.

SQL Server is a product of Microsoft's system software division, which develops and markets Microsoft's operating systems products. Microsoft has announced that its application products, such as its Excel spreadsheet, will support SQL-based access to SQL Server over time. The company is also heavily recruiting other personal computer software developers to build front-ends to SQL Server.

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relational DBMS that supports disk mirroring and other special features for its fault-tolerant family of OLTP systems.

- Data General offers DG/SQL, an implementation of SQL for its MV family of minicomputer systems.

Digital has taken the most aggressive stance of these computer vendors by bundling the Rdb/VMS run-time modules with every copy of the VAX/VMS operating system. This move has drawn sharp criticism from the independent DBMS vendors, who charge that Digital is using its clout as a hardware vendor to gain unfair competitive advantage for what they claim is a mediocre product. In fact, the independent DBMS vendors have continued to prosper on the VAX platform despite Digital's decision to bundle Rdb/VMS.

Digital's bundling move and IBM's packaging of SQL across its product line indicate the new importance that computer vendors are attaching to relational database technology and SQL. In the future, these vendors may further enhance the performance of their proprietary SQL products by building database support directly into their hardware and operating systems. In response, the independent DBMS vendors will continue to offer innovative new features, portability across multiple hardware platforms, and independence from any particular computer vendor. It thus seems likely that the symbiotic relationship between computer vendors and independent DBMS vendors which prevailed in the 1980s will be replaced by a growing conflict in the 1990s.

SQL STANDARDS

The adoption of an official ANSI/ISO SQL standard was one of the major factors that secured SQL's place as the standard relational database language in the 1980s. Compliance with the ANSI/ISO standard has become a checkoff item for evaluating DBMS products, so each DBMS vendor claims that its product is "compatible with" or "based on" the ANSI/ISO standard.

Despite these claims, no current SQL product is totally compatible with the ANSI/ISO standard, although many of the products are slowly moving toward compatibil-

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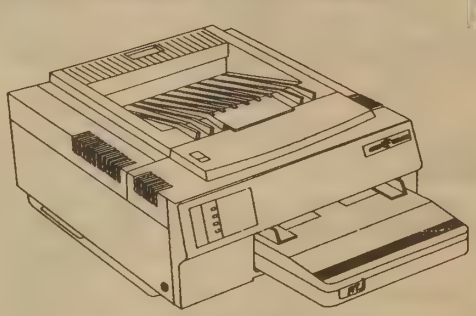

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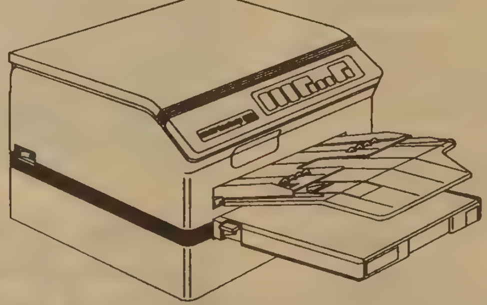

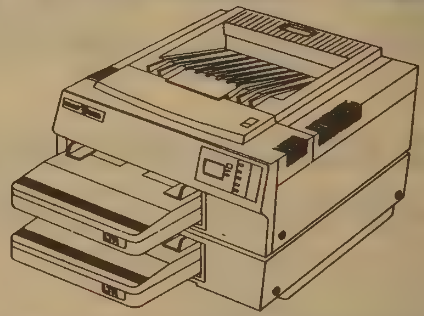

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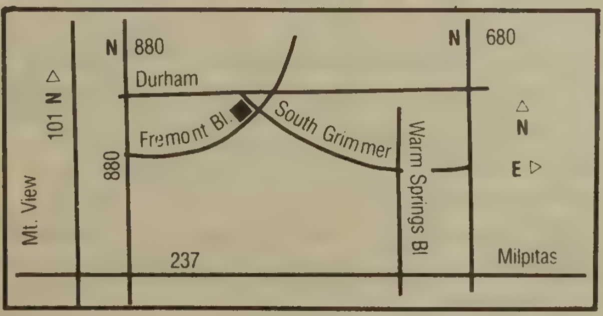

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ity. For example, the latest releases of DB2 and Oracle contain minor changes that were made for the sake of compliance with the standard. This trend should continue through the early 1990s, creating a slow convergence toward the ANSI/ISO standard.

The ANSI/ISO standard is relatively weak, with many omissions and areas that are left as implementation choices. For the past several years, the standards committee has been working on an expanded SQL2 standard that remedies these weaknesses and significantly extends the SQL language. Unlike the first SQL standard, which specified features that were already available in most SQL products, the SQL2 standard is an attempt to lead rather than follow the market. It specifies features and functions that are not yet widely implemented in today's DBMS products, such as scroll cursors, standardized system catalogs, much broader use of subqueries, and a new error message scheme. It remains to be seen whether DBMS vendors will see more competitive advantage in adopting these new features or in continuing to extend SQL in their own proprietary directions.

In addition to the ANSI/ISO SQL standard, IBM's SAA SQL standard will be a powerful influence on SQL in the 1990s. As the developer of SQL and the largest DBMS software vendor in the world, IBM's SQL decisions have always had a major impact on other vendors of SQL products. When the IBM and ANSI SQL dialects have differed in the past, most independent DBMS vendors have chosen to follow the IBM standard. It is very

ORACLE CORPORATION

Oracle Corporation was the first DBMS vendor to offer a commercial SQL product, preceding IBM's own announcement by almost two years. During the 1980s, Oracle grew to become the largest independent DBMS vendor, with annual sales in the one billion dollar range. Today it is a major DBMS competitor, selling its products through an aggressive direct sales force and through reseller arrangements with several midrange computer manufacturers.

The Oracle DBMS was originally implemented on Digital minicomputers, and sales of Oracle on the VAX continue to pace the company's growth. However, one of the major advantages of Oracle is its portability. Oracle is currently implemented on nearly 100 different types of computer systems, giving it the broadest availability of any DBMS product. Oracle implementations are available for MS-DOS, OS/2, and the Macintosh in the personal computer market, for Sun, MIPS and many other UNIX-based workstations, for a very large variety of minicomputer systems, and for IBM mainframes. Using Oracle's SQL*Net networking software, many of these Oracle implementations can participate in a distributed network of Oracle systems, providing remote access from one system to another. The company has outlined a plan to provide full distributed DBMS capabilities in stages.

The Oracle DBMS was originally based on IBM's System/R prototype, and has remained generally compatible with IBM's SQL-based products. In recent years, Oracle has been aggressively marketing the OLTP performance of its DBMS, using benchmark results from multiprocessor systems to substantiate its claim as the OLTP performance leader. Oracle Version 6 includes a special transaction processing option for which the company charges a premium. The transaction processing option also includes PL/SQL, an extension of SQL with programming language statements which analysts generally consider a response to Sybase's Transact-SQL dialect.

Oracle Corporation has combined good technology with an aggressive salesforce and high-profile marketing campaigns. The company is attempting to exploit these advantages as it tries to extend its dominance into the personal computer arena with its OS/2-based products. In other attempts to enhance its competitive position, Oracle launched several new subsidiaries in the systems integration, manufacturing software, and financial software markets. Each subsidiary offers products and services based on the Oracle DBMS, but taps revenue opportunities that lie outside the DBMS market. The subsidiaries also contribute to the maintenance, support, and consulting revenue which has become an important part of the company's sales. Thus Oracle is positioning itself not just as a DBMS vendor, but as a major independent software vendor across a broad spectrum of systems.

SYBASE, INC.

Sybase is a mid-1980s DBMS startup company, funded by tens of millions of dollars in venture capital. The company's founding team and many of its early employees were alumni of other DBMS vendors, and for most of them, Sybase represented the second or third relational DBMS that they had built. Sybase positioned its product as "the relational DBMS for on-line applications" and stressed the technical and architectural features that distinguished it from other SQL-based DBMS products. These features included:

- A client/server architecture, with client software running on Sun and VAX workstations and IBM PCs and the server running on VAX/VMS or Sun systems
- A multi-threaded server that handled its own task management and input/output, for maximum efficiency
- A programmatic API, instead of the embedded SQL interface used by most other DBMS vendors
- Stored procedures, triggers, and a Transact-SQL dialect that extended SQL into a complete server programming language

Aggressive marketing and a first-class roster of venture capital backers gained Sybase the attention of industry analysts, but it was the subsequent OEM deal with Microsoft and Ashton-Tate that positioned the company as an up-and-coming DBMS vendor. Renamed SQL Server, the Sybase DBMS was ported to OS/2, and marketed by Microsoft to computer systems vendors (along with OS/2), and by Ashton-Tate through retail computer channels. In 1989, Lotus Development joined Microsoft and Ashton-Tate as Sybase investors. Although far afield from the initial Sybase focus on VAX-based OLTP applications, these events in the PC market boosted the prominence of Sybase.

The innovations in the Sybase product made it the most technically "flashy" DBMS in the late 1980s, and the company's late start gave it a technical competitive edge. By 1990, these innovations had provoked a competitive response from the other leading independent DBMS vendors, many of whom had announced plans for their own support of client/server architectures, procedural SQL dialects, stored procedures, triggers, and so on.

Sybase product development has tended to concentrate on the core features of the DBMS itself, with relatively less attention to the associated tools and utilities. The product line includes SQL Workbench, an application development and testing environment with a graphical user interface, but lacks the extensive set of forms packages, report writers, graphics packages, and other tools offered by some other DBMS vendors.

Sybase is a privately held company with revenues in the $50 million range.

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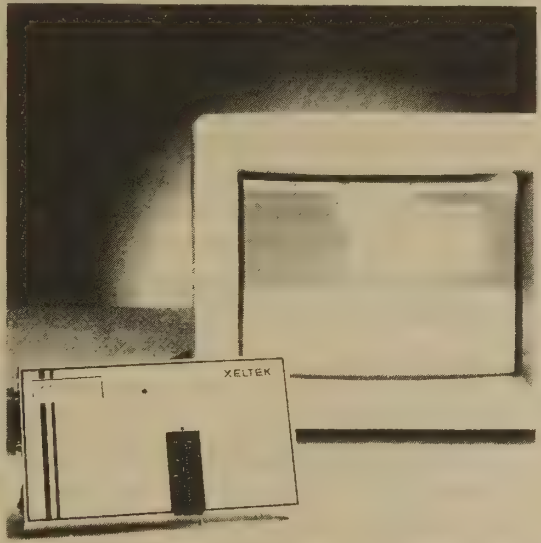

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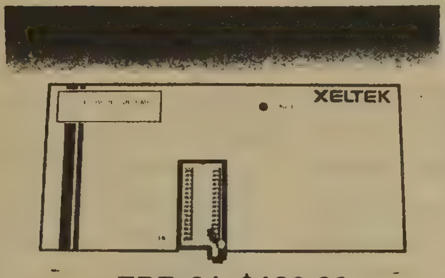

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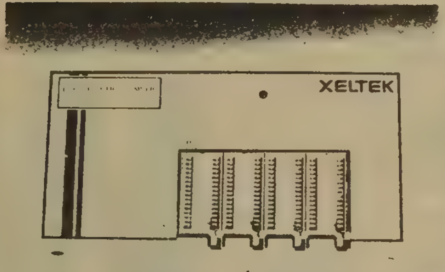

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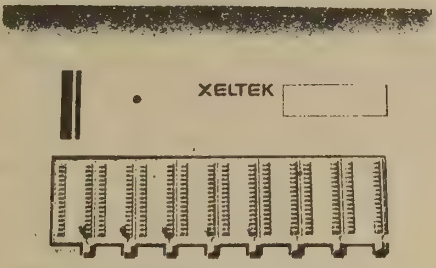

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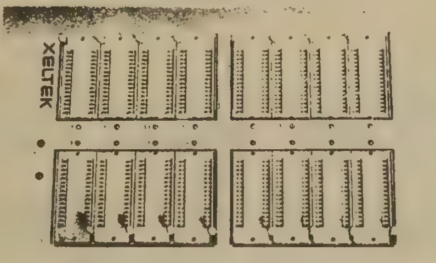

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likely that the same decision will be made in the future.

While the ANSI/ISO and IBM SAA standards focus on the SQL language itself, other groups have been working to standardize the application programming interface to SQL. The Remote Data Access (RDA) standard being developed by ISO falls into this category; it is an attempt to standardize database access across a network. The RDA work has progressed very slowly, with considerable redefinition of the proposed standard over the last few years.

In 1989 a group of database vendors, calling themselves the SQL Access Group, joined together to develop their own standard for a SQL applications program interface. Although the SQL Access Group included several of the most important DBMS vendors, both IBM and Sybase declined to participate, casting doubt on the widespread adoption of the SQL Access Group's recommendations.

In summary, the various SQL standards will continue to grow and evolve through the 1990s. The existence of several different standards, together with the introduction of new extensions and proprietary features from the DBMS vendors, ensures that there will not be a single, portable version of SQL in the near future.

Instead, the SQL standards will continue to be treated as guidelines and goals rather than rules. DBMS vendors will generally follow the IBM standard where there is one, and seek opportunities to differentiate their product in areas that IBM has not yet addressed.

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Tandem is the leading vendor of fault-tolerant computer systems. Many Tandem systems are sold to financial services and transportation companies for use in on-line transaction processing applications. The company's systems run the proprietary TXP operating system, and fault-tolerant applications are generally written in the proprietary Tandem Application Language (TAL). However, database management is provided by a SQL-based relational DBMS called NonStop SQL.

Because of Tandem's OLTP emphasis, NonStop SQL has pioneered several special techniques, such as disk mirroring, which are unique among SQL implementations. NonStop SQL also takes advantage of the Tandem multiprocessor architecture and provides distributed database capabilities. The programmatic interface to NonStop SQL is through embedded SQL.

SQL LANGUAGE EXTENSIONS

SQL is just over ten years old as a commercial product, and it is still actively growing and changing in its adolescence. DBMS vendors are investing heavily in SQL extensions and new features, including:

•Procedural statements. The addition of traditional programming language state-

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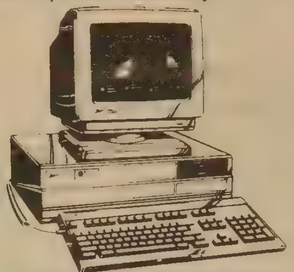

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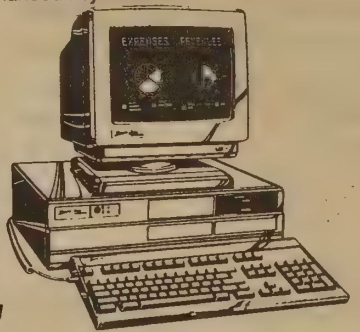

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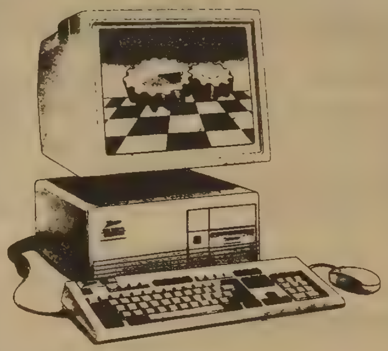

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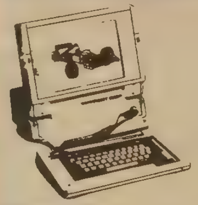

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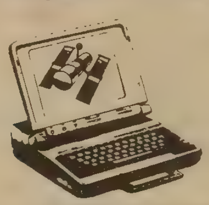

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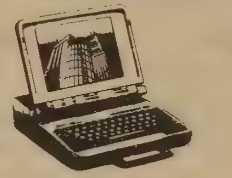

- 16MHz 32-bit 80386SX
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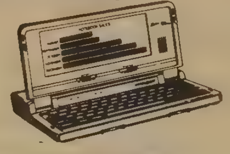
MINISPORT



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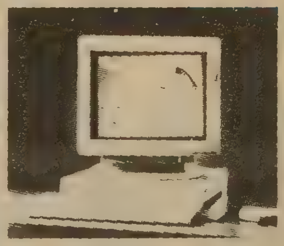

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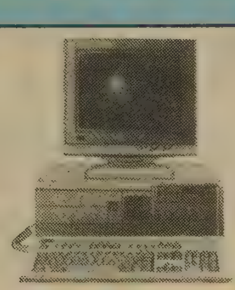

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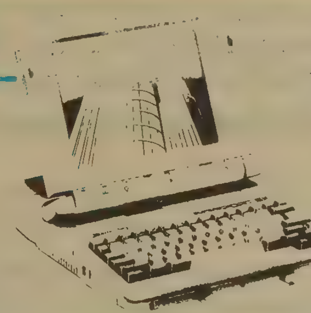

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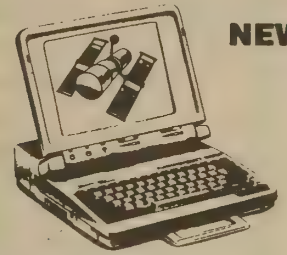

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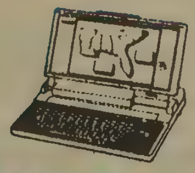

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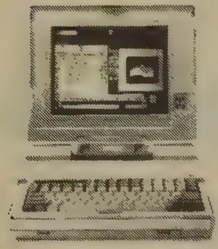

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ments (IF/THEN/ELSE, GOTO, FOR and WHILE loops, and so on) to SQL allows users to "glue together" SQL DML and DDL statements into complete SQL scripts. This capability is especially useful in a client/server architecture, because the server can execute an entire SQL script without statement-by-statement interaction with the requesting program, minimizing network traffic.

•Stored procedures. Stored procedures allow a sequence of SQL statements to be precompiled, named, and stored in the database for later execution. They combine the flexibility of dynamic SQL (the application program can decide which procedure to execute at run-time) with the performance of static SQL (the procedure code is precompiled, and the DBMS simply executes it at run-time).

•Triggers. Triggers allow a DBMS to automatically execute a SQL statement or statement sequence in response to an external event, such as an attempt to update, insert, or delete data in a table. With triggers, the DBMS can take a more active role in enforcing database integrity and business rules.

•Rules. Several DBMS vendors have begun to incorporate rules and other features borrowed from knowledge-based systems into their relational databases. Rules allow a database to encompass the "rules of thumb" and normal operating procedures of an organization, storing not only raw data but also knowledge about how an organization operates.

•Scroll cursors. Scroll cursors support the development of database browsing programs that allow a user to move freely forward and backward through a set of query results. This type of user interface can be very valuable in decision support and database query applications.

UNIFY CORPORATION

Unify Corporation is a supplier of UNIX-based relational DBMS products and database tools. In the mid-1980s Unify, Informix, Ingres, and Oracle were the four major UNIX-based DBMS competitors, with Oracle and Ingres battling for dominance as the "high-end" DBMS while Informix and Unify competed at the low end of the market. The Unify DBMS, since upgraded to become Unify 2000, is based on the network data model, with a SQL veneer for relational access. The embedded pointers and other features of the network data model give Unify excellent performance, but the lack of a true relational foundation has restricted the level of SQL support it can provide.

While the Unify DBMS remains an important part of the company's product line, over the last few years Unify's emphasis has shifted to database tools. The company's Accell application development environment is an advanced fourth-generation language designed to speed the development of interactive, forms-oriented data processing applications. Initially available only for use with the Unify DBMS, Accell now supports a range of SQL-based DBMS back-ends. It is an excellent example of a new class of "portable" database application development tools that have been adapted to work with a variety of SQL engines.

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The most active work on extending the SQL language is being done by the independent DBMS vendors, such as Sybase, Oracle, Ingres, and Informix. Sybase already supports procedural statements, stored procedures, and triggers in its Transact-SQL dialect. Ingres Version 6.3 added support for stored procedures and rules. Oracle supports procedural statements in the transaction processing option of Oracle Version 6, and it has announced referential integrity and stored procedure support for Oracle Version 7. Informix currently supports scroll cursors and offers Informix-4GL, a fourth generation language that combines SQL and procedural language statements.

In this area the 1990s are likely to continue the history of the 1980s, as each vendor introduces new SQL features that it hopes will provide a compelling reason for customers to purchase its DBMS products. The result is a continuous game of technical leapfrog, with each vendor forging ahead in certain areas while playing catch-up with its competitors in other areas. In the process, those features which the market deems important (procedural statements and stored procedures are the current favorites) will find their way into all of the products from leading independent DBMS vendors.

COMPLEX DATA TYPES

SQL was originally conceived and designed to handle typical data processing data such as integers, floating point and decimal numbers, and short character strings. As relational databases have become more popular, however, users want them to store and organize other types of data, such as scanned images, computer-aided-design drawings, spreadsheets, entire documents, and so on. Complex data types such as these are often referred to as binary large objects, or "blobs."

With the SQL language and DBMS technology of the 1980s, the only way to manage blobs was to store them in files, separate from the database. The database itself stored descriptive information about the object (such as a document's author, title, date, and keywords) and the name of the file where the object was stored. The applications program could then use SQL to search the database, but was forced to use conventional file input/output to process the blob itself. However, pressure has mounted to extend SQL and support blobs directly within the database.

At first it may seem straightforward to support a blob directly as a SQL data type, stored in a column of a relational table. However, the matter of blob support raises several serious issues for SQL and the relational model:

•Nonatomic data. The relational model assumes that each column in each row contains a single, atomic data item, but blobs often have parts and subparts and sub-subparts. This structure cannot be represented without violating the relational model.

•Random retrieval. If a blob contains a substructure, the applications program may want to retrieve individual parts of the blob (for example, sections of a document or layers of a circuit board layout) without retrieving all of the blob. SQL doesn't provide any mechanism for selecting and retrieving parts of a data item.

•Memory limitations. With conventional SQL, an applications program fetches an entire row of data into its buffers for processing. However, a large blob can easily exceed the available main memory of a personal

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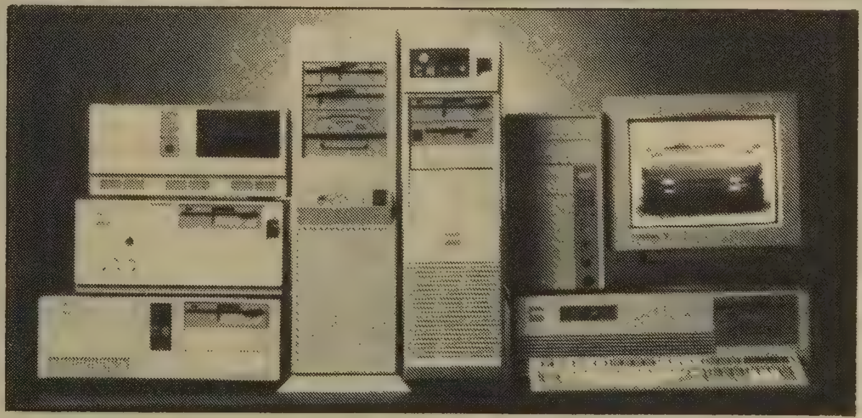

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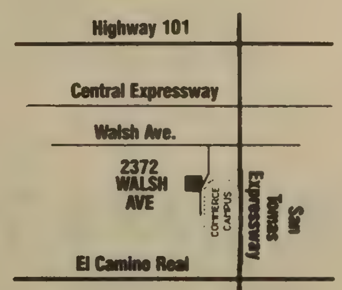

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computer. To process such blobs, a program must be able to store and retrieve them piece by piece, just as it processes data files.

•Searching. If a blob column contains text data, a user may want to select rows based on a full-text search of the contents of the blob. Other searches may be appropriate for other types of blobs. These nonstandard searches require extensions to the SQL language.

Despite these obstacles, support for blobs has become a hot issue, especially for DBMS products that run on personal computers and workstations that manipulate complex data objects. Informix, Ingres, and Sybase have all announced plans to support blobs in new versions of their DBMS products, and other DBMS vendors can be expected to follow. However, the development of techniques to store, retrieve, search, and process blobs is in its infancy and will continue to be an active area of SQL development and change well into the 1990s.

CLIENT/SERVER APPLICATIONS

The exploding popularity and aggressive pricing of personal computers has produced a major change in the way that organizations are implementing new data processing applications. Increasingly, application designers no longer assume a central minicomputer or mainframe communicating with dozens of users seated at "dumb" computer terminals. Instead, applications are migrating to personal computers, where they can take advantage of the PC's graphical user interface. The database that supports the application is stored on a database server, linked to the personal computers by a local area network. PC local area networks with OS/2-based database servers thus pose a serious competitive threat to minicomputers for new data processing applications.

This client/server approach to application design is accelerating the acceptance of relational databases, with the SQL language forming the interface between the personal computer and the database server. Some computer industry analysts, noting this phenomenon, have concluded that SQL database servers have become a commodity, and that the standardization of SQL will allow a SQL-based application to access data stored in any SQL-based database. Such pronouncements are at best premature, and probably off the mark. Performance and extended features are still major selling points for SQL-based DBMS servers, and major differences in SQL dialects make interchangeable front-end applications impossible to achieve with today's products.

SQL ACCESS FROM PC APPLICATIONS

The growing use of personal computers in corporate networks has generated intense interest in providing access to corporate databases from within desktop applications. PC users want to be able to use off-the-shelf PC-based tools to analyze and graph corporate data and incorporate it into their spreadsheets and word processing documents. DBMS vendors, PC software vendors, and personal computer vendors have all announced strategies and tools for providing this remote data access:

•Oracle, Ingres, and Sybase each offer an applications programming interface on one or more PC platforms (MS-DOS, MS-Win-

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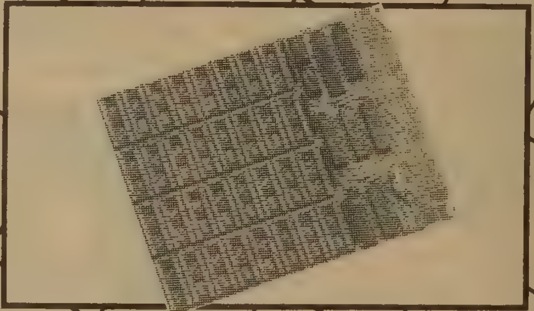

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•Lotus Development Corporation has announced its own data access interface, called Datalens, which is incorporated into Lotus 1-2-3 Release 3.0 and future Lotus products. Datalens allows a spreadsheet user to select, insert, and delete data from SQL-based databases for which Datalens drivers have been developed. Datalens drivers have been announced or demonstrated for Oracle, Novell's Netware SQL, Gupta's SQLBase and dBASE IV.

•Several PC application vendors have positioned their products as portable front-ends for access to SQL-based databases.

Paradox, DataEase, Advanced Revelation, dBASE IV and 1-2-3 have all been demonstrated as front-ends to multiple back-end servers, including SQL Server, OS/2 Extended Edition and Oracle Server. In each case, a separate database adapter generates the SQL dialect required by each supported server.

•Apple Computer has announced CL/1, a standard SQL-based connectivity language that links Macintosh applications to minicomputer and mainframe databases, including Oracle, Ingres, Sybase, Informix, Rdb/VMS, DB2, and SQL/DS. CL/1 masks the differences between these databases, allowing a Macintosh application to make standard CL/1 requests for remote data access, regardless of the brand of DBMS being accessed.

•Apple's HyperCard has also emerged as a standard front-end for remote database access on the Macintosh. Apple's own CL/1 product provides a HyperCard interface, and HyperCard is also supported as a database front-end by both Oracle and Sybase.

PC access to corporate data is a relatively new phenomenon and vendor strategies for providing that access are just beginning to solidify. The enthusiastic response to the early products from both PC users and data processing professionals indicates the importance of this phenomenon, and should dramatically expand the set of PC applications that support remote data access in the near future.

DATABASE TOOLS

The growing popularity of SQL-based DBMS products has produced a strong secondary market for database tools. These tools support the development, administration, and use of SQL-based databases, and include:

•application development tools, such as 4GLs, forms packages, and computer-aided software engineering (CASE) packages

•data access tools, such as graphical query interfaces, database browsing programs, and report writers

•database administration tools, including backup and recovery utilities and database performance monitors

•graphical user interface tools that support popular PC and workstation environments such as MS-Windows, OS/2, Open Look and Motif

Several DBMS vendors see the database tools market as a substantial business opportunity, either in addition to or in place of their

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core DBMS business. Ingres, for example, has signed an OEM agreement with Digital Equipment Corporation, under which Digital sells the Ingres database tools for use with its Rdb/VMS DBMS. Unify Corporation, a vendor of UNIX-based databases, has unbundled its Accell development environment and now offers it for use with other vendors' SQL-based databases.

In the PC arena, Ashton-Tate has positioned dBASE IV not only as a stand-alone DBMS, but also an application development tool and front-end for SQL Server. Gupta Technologies' SQLWindows provides a graphical user interface under MS-Windows, supporting Gupta's SQLBase and other SQL-based PC databases. Lotus Development Corporation, which began development of its own SQL database engine, has abandoned that strategy and repositioned its products as front-end tools for use with SQL Server and other SQL database engines. Over the next few years, database tools will emerge as a major application category in their own right, and the most popular database tools will provide support for a range of popular SQL-based database engines.

DISTRIBUTED DATABASES

Distributed database management is one of the most active areas of DBMS development today, and the steadily increasing support for distributed data will be one of the most important developments of the 1990s. DBMS vendors will unveil distributed database support in stages, and announcements driven by competitive pressures will typically precede actual product availability by six months or more.

For example, Oracle disclosed plans for two-phase commit protocols and location transparency in Oracle Version 7 in 1989, a full year before its availability. It will take until the mid-1990s or beyond until the ability to transparently update remote databases with full database integrity is a routine feature of SQL-based products.

Most DBMS vendors are primarily focused on providing distributed database capability among their own DBMS products, with secondary emphasis on gateways to other DBMS environments. Oracle, Ingres, and Rdb/VMS each provide gateways to the major IBM mainframe databases. Sybase also provides a DB2 gateway, and goes a step further with its Open Server specification, which allows third parties to build gateways to other DBMS environments.

Without any standards for distributed databases or the underlying protocols, gateways will continue to play a secondary role in the DBMS market. Distributed networks that mix different DBMS brands cannot provide the same kind of transparency and transaction integrity offered by a single-vendor network without such standards.

As in many other areas, IBM's actions could produce a dramatic change in distributed databases. To date, the protocols that IBM uses for internal communications among its distributed DBMS products are closed and proprietary to IBM. If IBM were to publish and standardize these protocols, however, independent DBMS vendors would rush to support them as a way of providing distributed access to DB2 and SQL/DS. The DBMS vendors could also use these IBM protocols as a "vendor-neutral" method of communicating among their DBMS systems, effectively providing a standard for implementing a heterogeneous distributed data-

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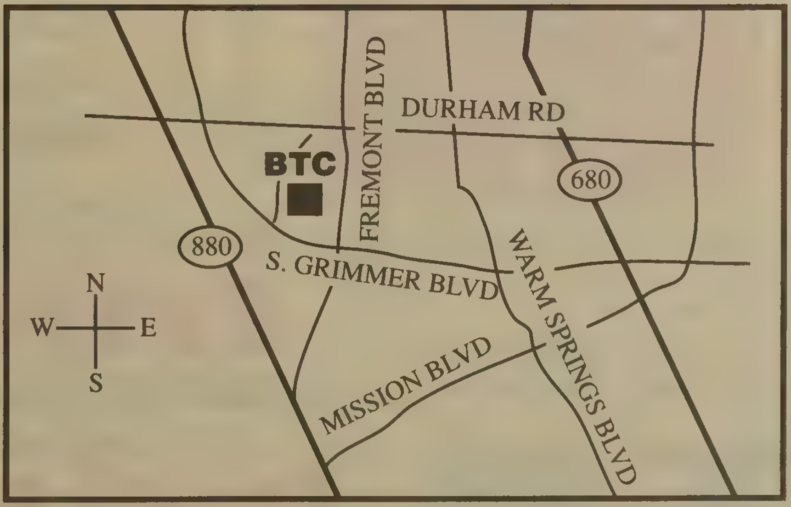
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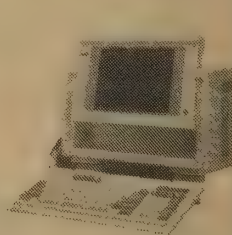

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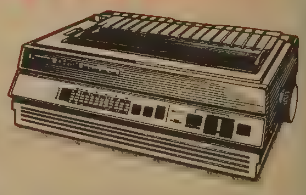

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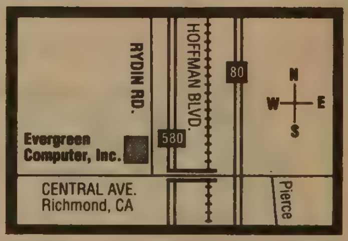

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base. Whether IBM will take such a dramatic step, or whether it will see a competitive advantage in having a closed, vendor-proprietary distributed DBMS, remains to be seen.

OBJECT-ORIENTED DATABASES

Much of the academic research in the database area over the past several years has been concentrated on new, "post-relational" data models. Just as the relational model provided clear-cut advantages over the earlier hierarchical and network models, the goal of this research is to develop new data models that will overcome some of the disadvantages of the relational model.

Today, most research on new data models is focused on so-called "object-oriented" databases. Enthusiastic supporters of object-oriented databases claim that they are the next generation of database systems and predict that they will mount a serious challenge to relational databases by the turn of the century.

Unlike the relational data model, where Codd's 1970 paper provided a clear, mathematical definition of a relational database, there is no agreement on exactly what an object-oriented database is. When researchers use the term, they are generally describing a database that uses the same organizing principles as object-oriented programming. Those principles include:

•Objects. In an object-oriented database, everything is an object and is manipulated as an object. The tabular, row/column organization of a relational database is replaced by the notion of collections of objects. Generally, a collection of objects is itself an object and can be manipulated in the same way that other objects are manipulated.

•Classes. Object-oriented databases replace the relational notion of atomic data types with a hierarchical notion of classes and subclasses. For example, VEHICLES might be a class of object, and individual members ("instances") of that class would include a car, a bicycle, a train, or a boat. The vehicles class might include subclasses called CARS and BOATS, representing a more specialized form of vehicle. Similarly, the CARS class might include a subclass called CONVERTIBLES, and so on.

With the support of an official standard, the market clout of IBM, and the backing of several major independent DBMS vendors, the SQL bandwagon is simply too powerful to be derailed by a handful of object-oriented DBMS vendors any time in the near future.

•Inheritance. Objects inherit characteristics from their class and from all of the higher-level classes to which they belong. For example, one of the characteristics of a vehicle might be "number of passengers." All members of the CARS, BOATS and CONVERTIBLES classes also have this attribute, because they are subclasses of VEHICLES. The

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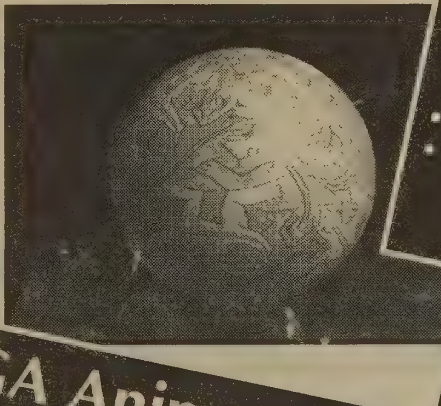

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CARS class might also have the attribute "number of doors," and the CONVERTIBLES class would inherit this attribute. However, the BOATS class would not inherit the attribute.

•Messages and methods. Objects communicate with one another by sending and receiving messages. When it receives a message, an object responds by executing a method, a program stored within the object that determines how it processes the message. Thus an object includes a set of behaviors described by its methods. Usually an object shares many of the same methods with other objects in its class.

These principles and techniques make object-oriented databases well-suited to applications involving complex data types, such as computer-aided-design or compound documents that combine text, graphics, and spreadsheets. The database provides a natural way to represent the hierarchies that occur in complex data.

For example, an entire document can be represented as a single object, composed of smaller objects (sections), composed of still smaller objects (paragraphs, graphs, and so on). The class hierarchy allows the database to track the "type" of each object in the document (paragraphs, charts, illustrations, titles, footnotes, and so on). Finally, the message mechanism offers natural support for a graphical user interface. The applications program can send a "draw yourself" message to each part of the document, asking it to draw itself on the screen. If the user changes the shape of the window displaying the document, the application program can respond by sending a "resize yourself" message to each document part, and so on. Each object in the document bears responsibility for its own display, so new objects can easily be added to the document architecture.

There are several commercial object-oriented databases currently under development, but only a handful are available today as commercial products. However, object-oriented databases have already stirred up a storm of controversy in the database community. Proponents claim that object-oriented databases will eventually replace the relational data model. Critics claim that object-oriented databases are simply a rehash of the hierarchical databases of the 1960s, with new terminology and a new twist on old concepts. Relational database vendors claim that most, if not all, of the benefits of object-oriented databases can be achieved by adding blob support to a relational database.

Object-oriented databases will likely play an increasing role in specialized market segments, such as engineering design, compound document processing and graphical user interfaces. However, it is unlikely that they will have a major impact on mainstream data processing applications over the next few years. With the support of an official standard, the market clout of IBM, and the backing of several major independent DBMS vendors, the SQL bandwagon is simply too powerful to be derailed by a handful of object-oriented DBMS vendors any time in the near future. However, the same observation could have been made about the market potential of relational databases and SQL against the established DBMS leaders just a decade ago. Of all the trends in the database market, the development of object-oriented databases is the only one that threatens the continued dominance of SQL as the decade unfolds. ■

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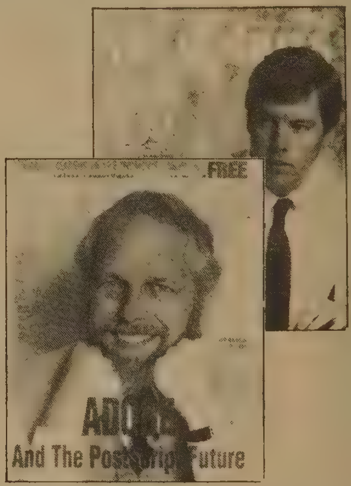

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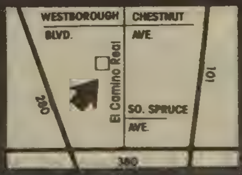

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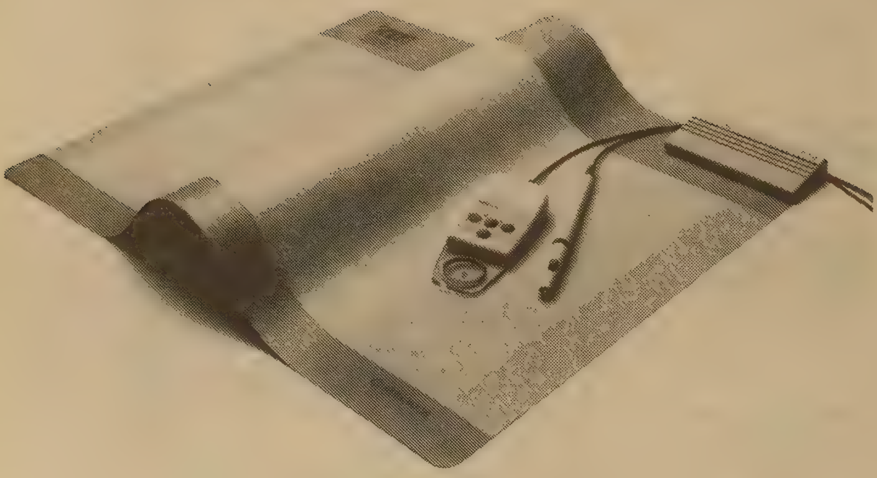

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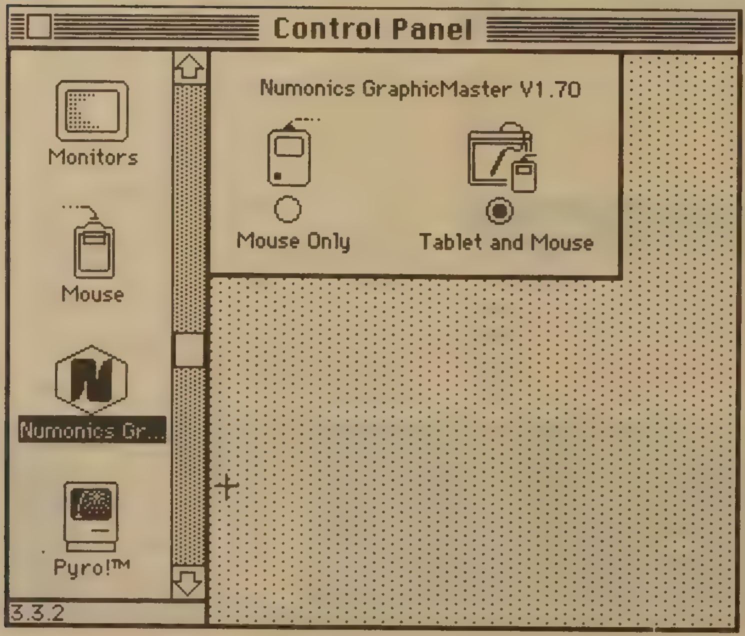
List price of GridMaster is $469 with the four-button puck, and $449 with the stylus. The interchangeable stylus and puck can be purchased separately ($105 and $75 respectively). Competing tablets of this size cost over $600. A twelve-page booklet explains basic setup and operation. There is a toll-free number for customer support. The tablet carries a two-year warranty; the stylus and puck have a one-year warranty.

This tablet would not be cost-effective for Mac Plus or SE users. Even for a 13" monitor, the less expensive CalComp Wiz (about $250) might be preferable. But graphics professionals requiring a large active surface area for tracing or freehand drawing should consider GridMaster. (Numonics Corp., 101 Commerce Dr., Montgomeryville, PA 18936, 215/362-2766)



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GAME REVIEWS

By Mike Markowitz

As computers get greater speed and memory, graphics attain higher resolution and richer color palettes, and programmers become more skillful and numerous, we should be on the brink of a Golden Age of computer gaming.

The hard disk alone is making for a revolution in computer games by providing scope for really large simulations. Some observers think that the next major development in games will be the integration of high quality digitized sound and voice synthesis. Some still think that interactive compact videodisc programs will become a significant market.

I think we're looking at a dead end in computer gaming unless we can make some serious breakthroughs in user interface technology. That means new hardware, and hardware cannot develop a viable market without standards.

VIRTUAL REALITY

Recently, the concept of "virtual reality" has been getting a lot of attention from simulation designers working at the high end of the technology. The idea is to place the user in a computer-generated visual, auditory and kinesthetic environment. The enabling technologies include a new generation of very tiny high-resolution displays that can be built into binocular goggles or helmets, and the VPL Dataglove, a device that covers your hand with a network of small, precise position and motion sensors. With appropriate software, a computer could display the changing 3-D scene as you move your head, including the image of your own Datagloved hand manipulating computer-generated objects. There is even a Datasuit, that does the same thing for a user's entire body. Generating and maintaining even the simplest "virtual reality" requires more computational horsepower than today's best desktop computers can deliver, but within three to five years the power will be there.

The prophet of virtual reality is novelist William Gibson (*Neuromancer, Mona Lisa Overdrive*) who has described a future network environment of Cyberspace, where users can sit at their terminals but feel that they are moving through a vast three-dimensional space in which databases are represented as tangible objects. Gibson's user interface is the ultimate in simplicity—a socket implanted in the skull and tied right in to the cerebral cortex.

THE CONTROL YOKE CONCEPT

While the technologies of virtual reality may someday provide intense multisensory hallucinatory entertainment for the masses, there is still a lot of room for short-term mechanical improvements in the computer game interface. The joystick and the mouse have served us well for many years, but for many kinds of vehicle-operator simulation they are pitifully inadequate.

This is particularly true for flight simulators. A typical modern plane is flown using a control column—something like a steering wheel that can be pushed forward or pulled back. The pilot has to coordinate turns using rudder pedals, and there is also a throttle lever for each engine. Desktop flight simulators usually have to devote nearly half the screen area to representing various controls and indicators, leaving only a limited screen window for the earth and sky. Many control functions have to be mapped to the keyboard in awkward ways that spoil the simulation's "realism" (or the willing suspension of disbelief that makes a game fun). A helicopter has two main control levers the cyclic and the collective, plus rudder pedals. Some modern fighter aircraft, like the F-16, rely on a side-stick controller, studded with switches and buttons. Tank commanders and gunners usually have simpler left- and right-hand grips.

What I envision is a unit a little smaller than a keyboard that plugs into the serial port of any computer. It would have a big central socket for a steering wheel or control column, and smaller sockets for left-and right-hand grips. Each socket would include a multi-pin electrical connector, and several strong, quick-disconnect mechanical fasteners. There would also be connectors for cables leading to two or three optional analog foot pedals, similar to those used by electric guitarists. The device would have its own signal-conditioning circuitry, maybe its own microprocessor, and perhaps even an expansion bus to allow for growth. Since some computers provide very little current through the serial port, it might need its own electric power supply, but good design might be able to avoid the necessity for plugging yet another little box into your power strip.

If the device could be standardized across the industry it could probably be mass produced for about $150, with the plug-in modules costing perhaps $50 to $75. Game software could be written to automatically sense the presence of the device, and use the appropriate drivers. Some publishers might

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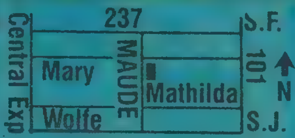

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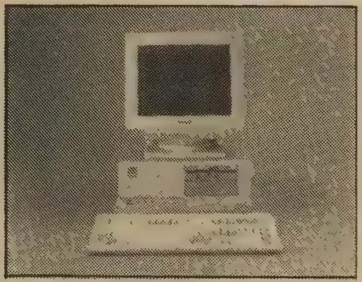

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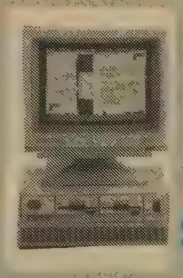

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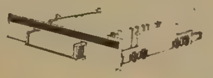

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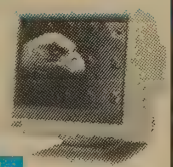

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DESKPRO 386/33	2MB MODULE	115144-001	$330.00
DESKPRO 386/20.25	1MB MODULE	113131-001	185.00
	4MB MODULE	113132-001	499.00
DESKPRO 386/20e	1MB BOARD	113644-001	285.00
	4MB BOARD	113645-001	635.00
	1MB MODULE	113131-001	185.00
	4MB MODULE	113132-001	499.00
DESKPRO 386s	1MB BOARD	113633-001	265.00
	4MB BOARD	113634-001	635.00
	1MB MODULE	113646-001	185.00
	4MB MODULE	112534 001	499.00
PORTABLE III	512K KIT	107331 001	55.00
	2MB KIT	107332-001	175.00
DESKPRO 386/16	4MB BOARD	108070-001	795.00
	8MB BOARD	108072 001	1325.00
PORTABLE 386	1MB KIT	107651-001	285.00
	4MB BOARD	107653-001	1050.00
SLT/286	1MB MODULE	110235-001	325.00

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MAC II IIx IIcx & SE/30	1MB KIT	MO218	$82.00
	4MB KIT	MO2707	305.00
	16MB KIT		2799.00
MAC IIci	4MB MIT	MO292LL-A	315.00
	16MB KIT		2899.00
MAC SE & PLUS	1MB KIT	MO218	82.00
	2MB KIT	MO219	155.00
	4MB KIT	MO2707	315.00

HP LASER Model	MEMORY Added	HP Part #	AMT Price
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	2MB MODULE	33444B	399.00
	4MB MODULE	33445B	499.00

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BRAVO/286	512K KIT	500510-010	$70.00
	2MB KIT	500510-002	185.00
	4MB KIT	500510-008	360.00
PREMIUM 286 ADVANCED	512K KIT	500510-001	70.00
	1MB KIT	500510-007	130.00
	2MB KIT	500510-002	190.00
	4MB KIT	500510-008	360.00
FASTBOARD 386	1MB KIT	500510-007	140.00
	4MB KIT	500510-008	360.00
PREMIUM WKST/286	512K KIT	500510-010	70.00
	2MB KIT	500510-002	185.00
PREMIUM WKST 386SX	512K KIT	500510-010	70.00
	1MB KIT	500510-007	135.00
	2MB KIT	500510-002	180.00
	4MB KIT	500510-008	360.00
PREMIUM 386/16	1MB KIT	500510-007	130.00
	4MB KIT	500510-008	360.00
PREMIUM 386	1MB KIT	500510-003	165.00
	4MB KIT	500510-004	379.00
PREMIUM 386c	1MB KIT	500510-007	130.00
	4MB KIT	500510-008	360.00
PREMIUM 386/25ex	1MB SIMM	500718-001	140.00
PREMIUM 386/33	1MB SIMM	500718-002	155.00

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even wish to bundle their software with an appropriate hardware module. To use your Learjet flight simulator, you would plug in the control column, and the rudder pedals. To use your F-16 simulator, you would unplug the control column and plug in the handgrip. To use your Ferrari Testarossa simulator, you would plug in a steering wheel, and a gearshift lever, and the foot pedals would function as accelerator, clutch and brake.

The details of the industry standard would have to be hammered out between the electronic engineers and the marketing wizards, but there has to be a standard. The miraculous success of the MIDI standard in electronic music proves the possibility of such a thing.

A computer game industry standard control yoke (ISCY?) will greatly increase the kinesthetic richness of the user's experience. It will make serious flight (or driving) simulation possible, for the first time. It will blow the doors off Nintendo, and justify the purchase of a real computer for a whole new category of entertainment-oriented users. A company like Microsoft, which sells a lot of flight simulator software, manufactures a nice mouse, and has lots of experience in enforcing standards, could make it happen. Three or four of the leading game companies could make it happen. We could make it happen.

PIPEDREAM

Published By: Lucasfilm Games
For: Mac, IBM, Amiga, Atari ST, Commodore 64
Suggested Retail: C64 $29.95; all others $39.95

I thought I wasn't going to like PipeDream. It sat on the shelf for weeks. As a product of Lucasfilm Games, it certainly came with good credentials. As a example of off-disk copy protection (one of those secret decoder wheel gadgets) it certainly deserved encouragement.

But a plumbing simulation? A race against time to lay down pipe for the inexorable slurping advance of oozing pink goo? Okay, let's give it a try. Some days, anything is preferable to writing.

This is frustrating. I can't seem to get the hang of this. What a stupid game... Oh, that's how it works. Aha! That's better. Got it!

You place sections of pipe on a square grid by clicking in any square. The pipe sections come from a relentless dispenser—you have to play each one somewhere. In the advanced game you can toggle between two dispensers.

My Significant Other, who normally hates anything that appears on the Macintosh screen, also caught the Pipe Dream addiction, actually beating my highest score repeatedly. The young have quicker reflexes, I consoled myself.

Pipe Dream is available in Macintosh, IBM PC and Amiga versions. The Mac version is well-behaved, taking up a 9" diagonal window, regardless of the size of your monitor, and restricting its color palette to black, blue and pink. It is common to describe a good game as addictive, but this one can become an obsessive, compulsive, passionate activity. Some people go for that. (Lucasfilm Games, PO Box 10307, San Rafael, CA 94912, 415/662-1902)

WELLTRIS

Published By: Spectrum Holobyte
For: IBM PC, Macintosh, Amiga
List Price: $39.95

Russia has always produced the world's finest mathematicians and chess players, so it should be no surprise to see a Russian in the ranks of world-class computer game designers. The only surprise, perhaps is that Glasnost and Perestroika are moving so quickly that a game design originated in the Soviet Union is a commercial success in the Capitalist USA, with great promise for a repeat performance.

We played Welltris on a Macintosh IIcx in color, a Mac SE in black and white, and an IBM PC with CGA graphics. In every case the game was thoroughly enjoyable, although it uses only the arrow keys and the space bar—no mouse or joystick is needed.

Alexey Pajitnov, a mathematician who lives in Moscow, designed Tetris, a game of simple elegance and beautiful sophistication. Colored tiles made from different arrangements of four squares gradually drop across a narrow grid of squares. You can shift and rotate the falling tiles, with the object of filling entire rows at the bottom of the well. When a row is filled, it disappears and you gain points. If you allow a gap to develop in the bottom row, you are doomed, since the well will eventually fill up, ending the game. Vadim Gerasimov, an 18-year-old student of Computer Informatics at Moscow University, did the original programming on a PC. Spectrum Holobyte produced successful implementations for the IBM PC, Apple II, Amiga, Macintosh and other computers, using handsome graphics depicting scenes from Soviet life.

Welltris is a three-dimensional extension of the basic idea of Tetris. You are looking down into a well or pit. The floor is an 8 x 8 square grid. On the walls of the pit, colored shapes, made up of two to six small squares, randomly appear and gradually slide downward. When they reach the floor they slide until they hit something—either the opposite wall or part of another shape. When a row or column is completely filled, it flashes and disappears, and you gain points. You must find a place for each arriving shape somewhere on the floor of the pit—if there is no room, the shape gets stuck on the wall. The wall flashes and goes dead—out of play —until three more shapes have fallen. The game ends when all four walls are out of play.

This bare description does not do justice to the hypnotic, addictive quality of Welltris. There are endless subtleties and surprises. For example, when you move a falling shape so that it "wraps" around a corner, it can break apart or crumple into a smaller shape when it hits the floor.

The strategy of the game is to fill rows or columns as quickly as possible, to rack up points and create space for newly arriving shapes. You quickly learn the tactical finesse to hustle any falling shape into precisely the right position and orientation to complete a desired pattern.

Welltris uses an inoffensive copy protection scheme—an opening screen displays the flag of one of the 16 Soviet republics, and requires you to answer a question about that republic based on information in the manual. The bouncy folk tunes that accompany the program can be turned off, and so can the sound effects. For a greater challenge, you can even turn off the "hint" window that displays the next shape that will drop. There are three levels of difficulty and five game speeds. During a game, the pace gradually accelerates as your score increases, which ensures that the game will, eventually, come to an end.

We played Welltris on a Macintosh IIcx in color, a Mac SE in black and white, and an IBM PC with CGA graphics. In every case the game was thoroughly enjoyable, although it uses only the arrow keys and the space bar—no mouse or joystick is needed. ■

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50Z,55SX, 65SX	2MB MODULE	6450604	$ 950	$ 285
55SX,65SX	4MB MODULE	34F2933	$2,195	$ 722
50, 50Z, 55SX, 65SX	2-8MB EXP BRD w/2MB	1497259	$1,350	$ 595
	2-8MB EXP BRD w/4MB	1497259+	$2,040	$ 938
	2-8MB EXP BRD w/6MB	1497259+	$2,830	$1,201
	2-8MB EXP BRD w/8MB	1497259+	$3,620	$1,463
70-E61, 70-061, 70-121	1MB MODULE	6450603	$ 450	$ 129
	2MB MODULE	6450604	$ 950	$ 285
				**6450605 Required*
70-A21,A61, B21,B61	1MB MODULE	6450603	$ 450	$ 121
	2MB MODULE	6450604	$ 950	$ 285
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				**6450605 Required*
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	4MB MODULE	112534-001	$1,950	$ 475
	4MB BOARD	113634-001	$2,395	$ 595
DESKPRO 386/20,25	1MB MODULE	113131-001	$ 450	$ 164
	4MB MODULE	113132-001	$1,950	$ 465
DESKPRO 386/20E,25E	1MB MODULE	113131-001	$ 450	$ 164
	1MB BOARD	113644-001	$ 650	$ 258
	4MB MODULE	113132-001	$1,950	$ 465
	4MB BOARD	113645-001	$2,395	$ 595
DESKPRO 386/33	2MB MODULE	115144-001	$ 950	$ 299
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	8MB MODULE	116561-001	$5,195	$2,689
PORTABLE 386	1MB KIT	107651-001	$ 650	$ 259
	4MB BOARD	107653-001	$2,395	$ 985
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PORTABLE III	512K KIT	107331-001	$ 269	$ 49
	2MB KIT	107332-001	$1,100	$ 325
PORTABLE LTE	512K BOARD	117077-001	$ 295	$ 197
	1MB BOARD	117081-001	$ 650	$ 189
	2MB BOARD	117081-002	$1,250	$ 280
SLT/286	1MB BOARD	110235-001	$ 650	$ 295
APPLE MAC				
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	4MB KIT	MO2707		$ 298
IIci	4MB KIT	MO292LL-A	$ 950	$ 296
	4MB MODULE			$ 546
	16MB KIT		$6,995	$2,685
IIcx	1MB KIT	MO218	$ 250	$ 76
	2MB KIT	MO219	$ 450	$ 140
	4MB KIT	MO2707		$ 288
	4MB MODULE			$ 546
IIfx	4MB KIT	MO376LL-A	$ 950	$ 548
	16MB KIT		$6,995	$2,685
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AST RESEARCH				
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	512K KIT	500510-010	$ 138	$ 65
	2MB KIT	500510-002	$ 345	$ 174
BRAVO 386SX	512K KIT	500510-010	$ 138	$ 65
	2MB KIT	500510-002	$ 345	$ 174
PREMIUM 286 ADVANCED	1MB KIT	500510-007	$ 260	$ 125
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PREMIUM WS286/WS386SX	512K KIT	500510-010	$ 138	$ 65
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PREMIUM 486	2MB MODULE	500718-004	$ 850	$ 323
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T3100SX	2MB BOARD	PC15-PA8308U	$ 950	$ 337
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T3200SX	2MB KIT	PC12-PA8307U	$ 990	$ 280
	4MB KIT			$1,187
T5100	2MB BOARD	PC7-PA8301U	$1,190	$ 280
T5200/T8500	2MB KIT	PC10-PA8304U	$ 950	$ 280
ZENITH				
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Z386/20,25	1MB MODULE	ZA3600-ME	$ 899	$ 146
	2MB MODULE	ZA3600-MG	$1,299	$ 254
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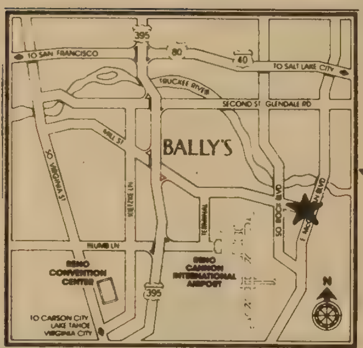
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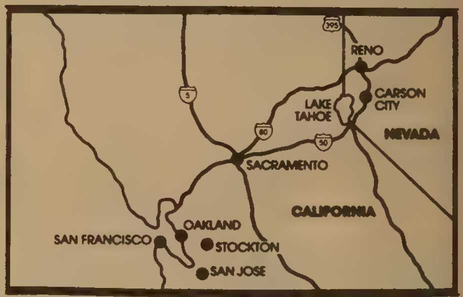
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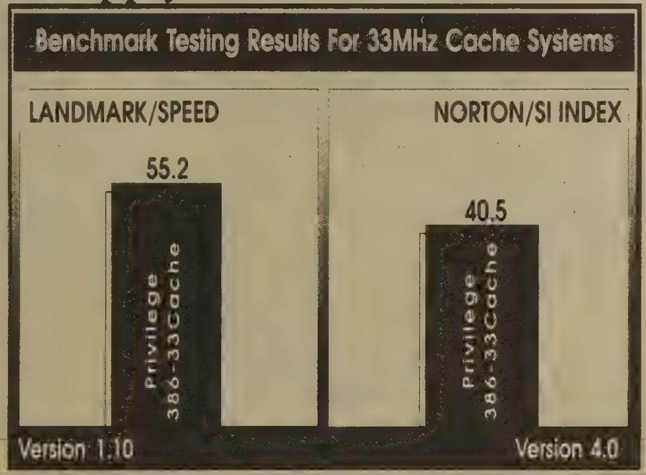

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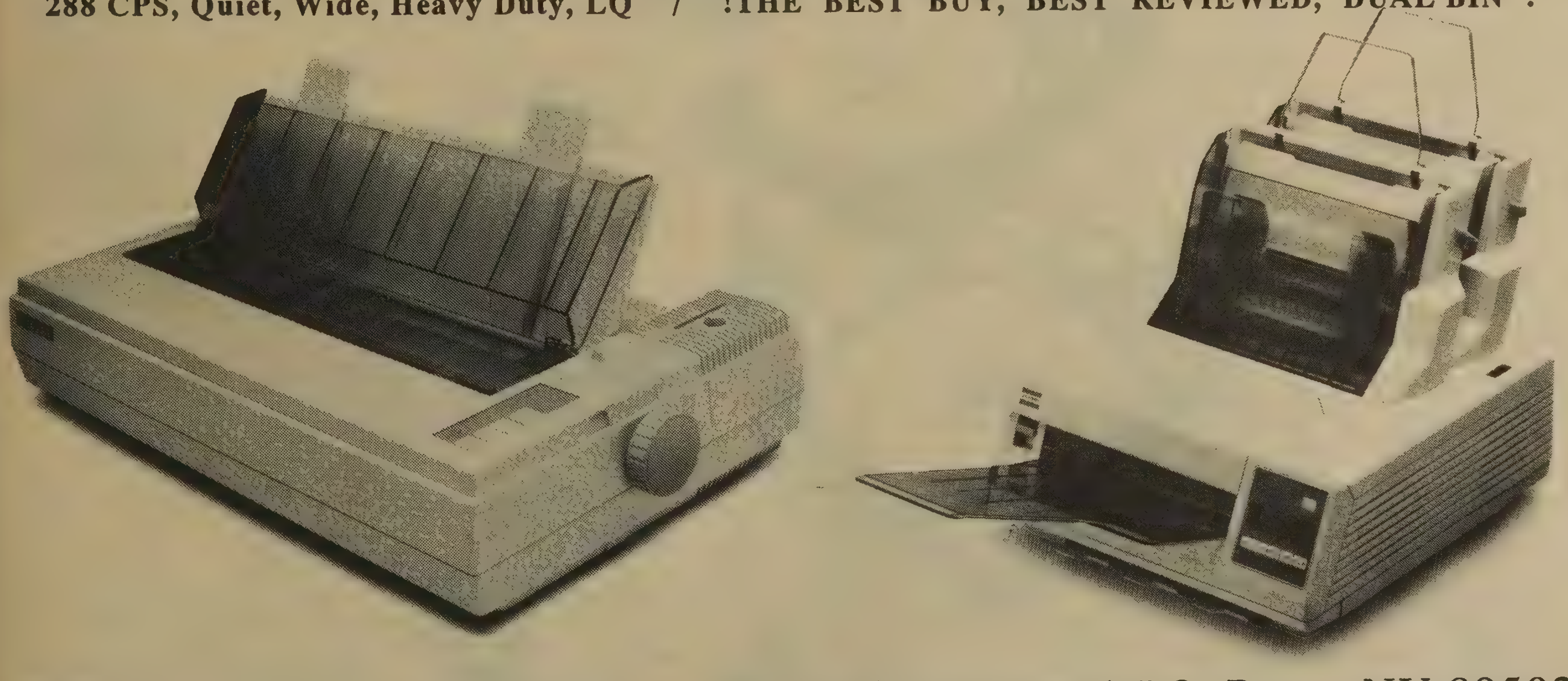

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DTC 6280	185
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DTC 5160	65

287-387

INTEL	
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8087-10	150
80287-10	215
80387-SX	325
80387-20	355
80387-25	460
80387-33	555

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1180	175
1191	225
1124	289
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LOGITECH	
SCANMAN PLUS	179
C-9 MOUSE	69
TRACKMAN	95
EVEREX	
MODEM 2400	129
2400+	149
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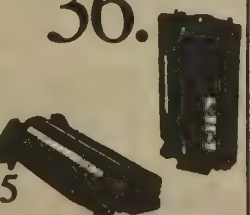

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Customer Support

continued from page 60

advertising.

The second and even more overlooked reality is that the support department is an incredible resource for ongoing market research. As any hotline alumni will readily affirm, you hear things on the phone that are available nowhere else. Your support reps are talking to your customers every day about how your products are being perceived and used in the real world. Not only does a surly hotline rep offend customers, but he also turns off the all-important feedback. The hotline is simply too vital an asset to waste on second-rate personnel.

If you are just starting out, your Customer Support group will (and should) consist of the engineers/programmers, sales people, accounting, and management. In short, everybody takes support calls. This is excellent practice, and should be jealously maintained throughout the company's growth. No company, no matter how large, can afford for its president and other members of the senior management team to be exempt from regularly scheduled hotline duties. You may not have the technical expertise to directly handle calls yourself, but you, and your engineers, need to be constantly listening to the customers' words without any filters or translations.

For established companies, the first priority of a Customer Satisfaction campaign is to revitalize the Support group and reorient the company's focus away from the technology and back to the user. The corrective measures that need to be applied to the products themselves will soon become readily apparent to all concerned from their direct hotline experiences. To further encourage customer communications, create a Customer Advisory Group and make sure it gets regular and active consultation from all areas of the company.

CONCLUSIONS: CREATING A WIN-WIN SITUATION

The vital point here is that one way or another, the company is going to spend money and time on making the product usable to the customer. If you take proper care in the initial design phase and in the creation of documentation, you'll reduce the load on the hotline department and achieve significant savings for your company.

If you ignore your customers and keep them out of the design phase, or if indeed there is no real design effort involved, the company will still spend money making the product usable—increased hotline requirements, multiple revisions and outright reworks, increased advertising attempting to counteract negative word-of-mouth effects, and staggering losses in missed opportunities for repeat sales.

The relative costs of the two approaches are incomparable. Catch-up efforts are no match for designed customer satisfaction. ■

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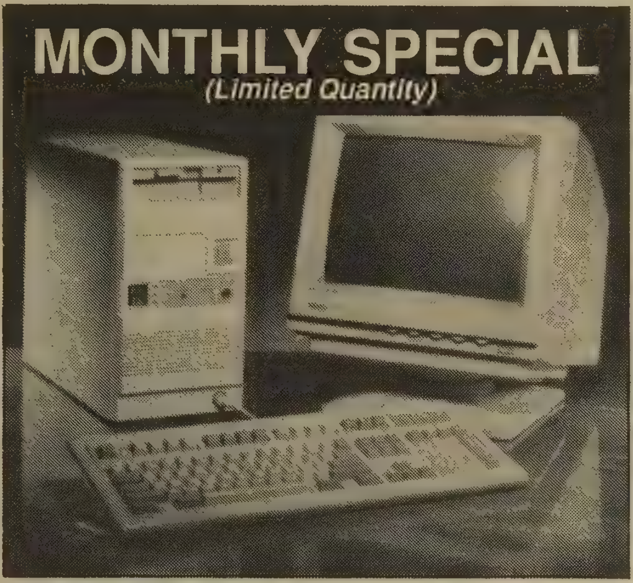

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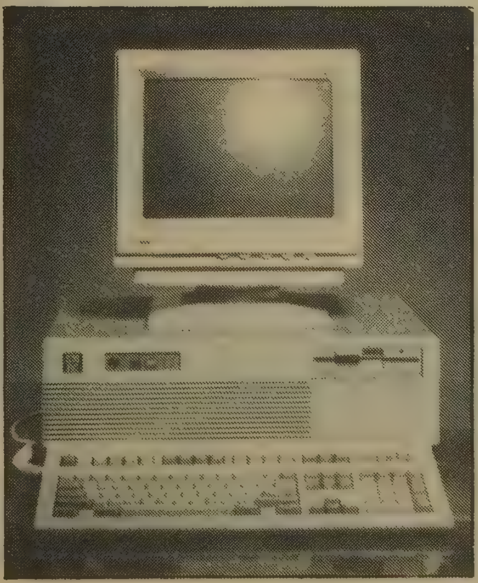

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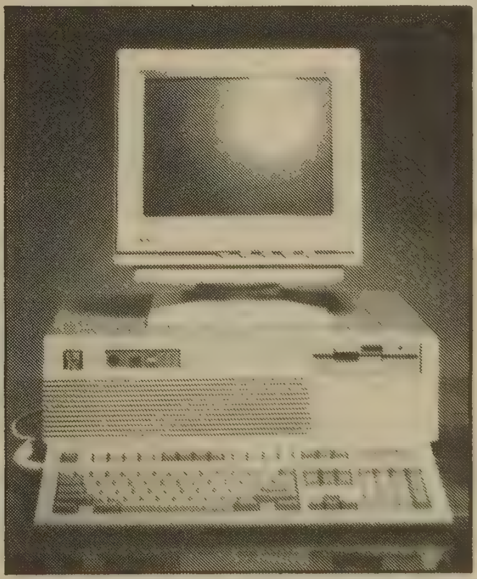

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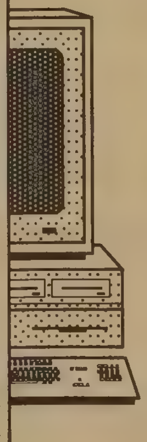

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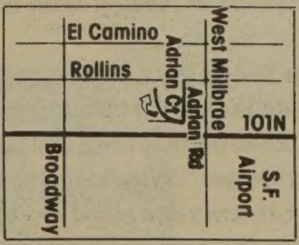

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Sometimes The Mail I Get Is More Interesting Than The Columns I Write. Sometimes Not.

BY JOHN C. DVORAK

DVORAK'S LAST COLUMN

I get tons of mail and wish I could answer it all personally. Instead I find a way to print the funniest or most interesting letters in columns like this during the slow summer months. I try not to do this too often lest people discover that the reader mail is more interesting than my columns.

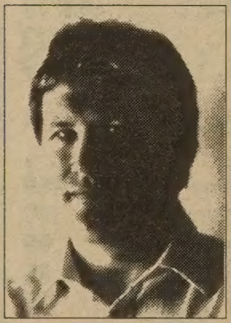
Let's start with Ben Meyers and his comments on new software, BASIC, Windows, and OS/2—all this said before the release of Windows 3.0.

The Windows API is one of the more complex in the whole computer industry. The OS/2 API is still more complex. Ditto for the Mac, but there have been Mac tools to relieve some of the programmer's tedium since fairly early on.

Microsoft has released NO Windows programming tools beyond the SDK, which is clumsy to use on good days. Even the Windows heavies admit to this. Only recently have third parties begun to ship development tools. At an early Windows 1.03 Developer's Seminar, I asked Steve Ballmer about Windows tools to generate interfaces and programs, and he responded that Microsoft was aware of the issue and was working on it. Really?

The consequences of the absence of tools are the relative absence of Windows apps and the slow growth of Windows as a GUI. (Despite the trillions of copies of Windows shipped, how many people really use Windows a lot, even now?) The entry cost to bring a Windows app to market is very high compared to non-Windows apps, in terms of hardware cost, software cost, steep learning curve, long debugging time, media costs (many diskettes), etc.

Your article combined with the above lead me to conclude that Bill has learned well from IBM how to manipulate a market with Fear, Uncertainty, and Doubt. Mostly the latter two, which is what the Microsoft Windows strategy has been all about in hindsight. Simultaneously promoting a standard and withholding tools from the market is a great way to create FUD about GUIs.



John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

The above comments remind me that there isn't even a BASIC for Windows, is there? Moving onward, Paul Hoffman sends this quick observation:

You can tell that there is a drug problem in the advertising industry. On the outside of a piece of junk mail from* UNIX TODAY! *"Introducing a newspaper as exciting as the market it covers!"

Greg Dunn on Networks:

Normally I don't read the columns in *PC Week*, but my eyes just happened to fall on the following, and I thought of you immediately.

Cheryl Currid says: "Trying to implement any semblance of conformity or consistency in a stand-alone PC environment is an impossible dream. There are simply too many Freddie Fix-its out there. Freddie, a well-meaning fellow, has a penchant for tweaking and tinkering with the software or menus. Then he tries to help out by tweaking the PCs of five or six other people in his department—except they aren't all the same. So you end up with no two PCs set the same way. This can cause real problems for the PC support staff debugging a problem when something goes wrong.

"On a LAN, however, you can keep Freddie from fouling up too much. You've got the option of giving him read-only access to the software applications areas and no access to his neighbors' configuration files."

John, on behalf of upholders of Law, Order, and Menu Consistency everywhere, I call on you to repent of your recalcitrant, anarchistic, indefensible position regarding local area networks. Surely you can understand the problems faced by PC support staffs who cannot be expected to support users who do things like establish a non-standard default directory in their 1-2-3 program, set their screen background color to green in MS Word, or—God forbid—write personal letters on the company's PC. This makes debugging problems impossible, especially when Something Has Gone Wrong.

An amusing observation comes from PR whiz Wes Thomas:

Bush says, "Saying no to drugs doesn't make you a nerd or a loser." I guess that means nerds should start taking drugs to avoid being seen as outcasts?

I think I'll write an "unfair to nerds" letter to Bush.

With that kind of attitude by our leaders, no wonder America is losing to the Japanese, who glorify their nerds.

Neil Rubenking posted this memo on PC Magnet (on CompuServe go PCMAGNET at the prompt) after I had written a gripe column about hotels that do not provide any way for a traveller to hook a laptop modem to the phone. As an aside I should mention that I was amused recently when I attended the Computer Press Association Awards at the New York Ritz-Carlton and found all the phones hard-wired and unusable. When I asked maintenance about modems they couldn't figure out what I was talking about. Rubes.

Neil says, "Aw, it's not SOOOOO bad when you gotta scrape the phone wires and/or use 'gator clips. The REALLY REALLY bad ones are like the Meridien in Newport Beach. For whatever perverse reason, they have the whole room controlled from the phone—e.g. you want it warmer/cooler, you press a button on the phone. It doesn't use a standard phone jack. When I called the concierge to ask about it, he had a fit—'You didn't UNPLUG it did you? Oh, good, because if you DO it automatically checks you out of the hotel!' Yup, those are the worst. Far as I could tell, there was NO WAY to use a modem over a line like that! ON the other hand, the places that have a separate data line near the desk should get extra credit. Right off, the only one like that I can remember is the Chaminade in Santa Cruz."

It's true, these phones have no way of hooking to a modem as far as I can tell. Worse, the handset is square so you can't even put acoustic cups on the thing. It's unbelievable. ■

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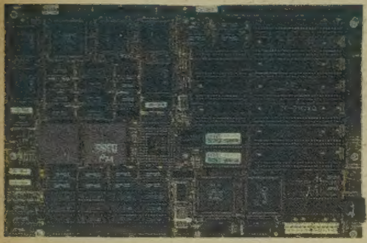

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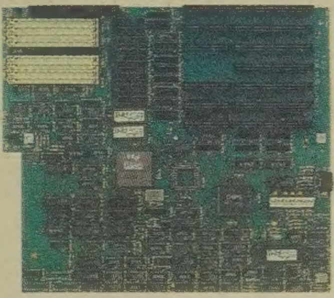

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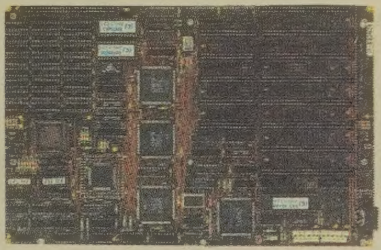

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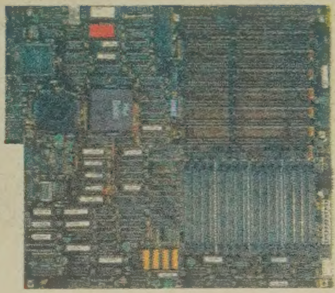

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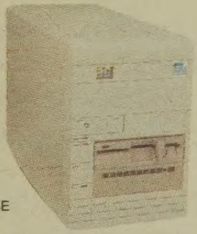

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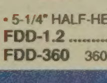

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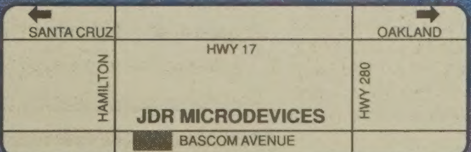

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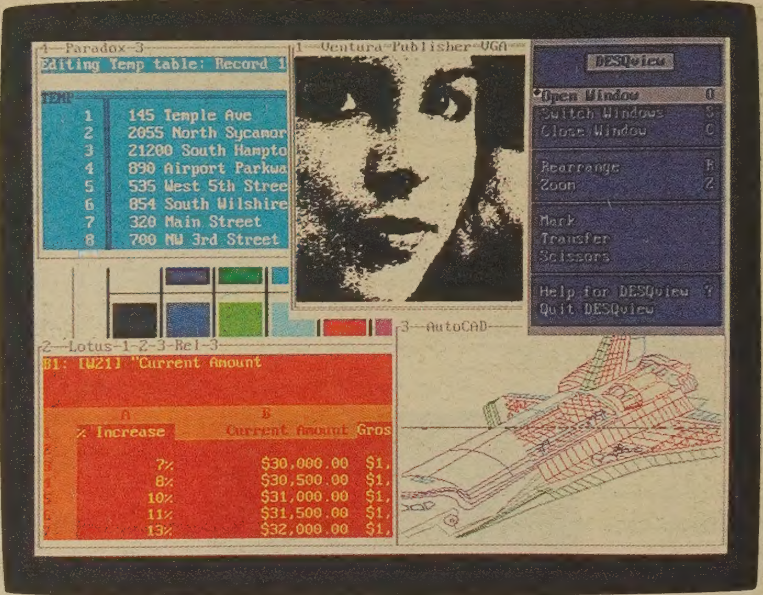

```
Editing Temp table: Record 1
TEMP
  1   145 Temple Ave
  2   2055 North Sycamor
  3   21200 South Hampto
  4   890 Airport Parkwa
  5   535 West 5th Stree
  6   854 South Wilshire
  7   320 Main Street
  8   700 NW 3rd Street
```

```
B1: [W21] "Current Amount
       A               B
  % Increase    Current Amount  Gros
        7%        $30,000.00    $1,
        8%        $30,500.00    $1,
       10%        $31,000.00    $1,
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DESQview System Requirements: IBM Personal Computer and 100% compatibles (with 8086, 8088, 80286, or 80386 processors) with monochrome or color display; IBM Personal System/2 • Memory: 640K recommended; for DESQview itself 0-145K • Expanded Memory (Optional): expanded memory boards compatible with the Intel AboveBoard; enhanced expanded memory boards compatible with the AST RAMpage; EMS 4.0 expanded memory boards • Disk: two diskette drives or one diskette drive and a hard disk • Graphics Card (Optional): Hercules, IBM Color/Graphics (CGA). IBM Enhanced Graphics (EGA), IBM PS/2 Advanced Graphics (VGA) • Mouse (Optional): Mouse Systems, Microsoft and compatibles • Modem for Auto-Dialer (Optional): Hayes or compatible • Operating System: PC-DOS 2.0-4.0; MS-DOS 2.0-3.3 • Software: Most PC-DOS and MS-DOS application programs; programs specific to Microsoft Windows 1.03-2.1, GEM 1.1-3.0, IBM TopView 1.1 • Media: DESQview 2.0 is available on either 5-1/4" or 3-1/2" floppy diskette.

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